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# THE FOUNDRY

VOL. I. NOVEMBER, 1892. No. 3.


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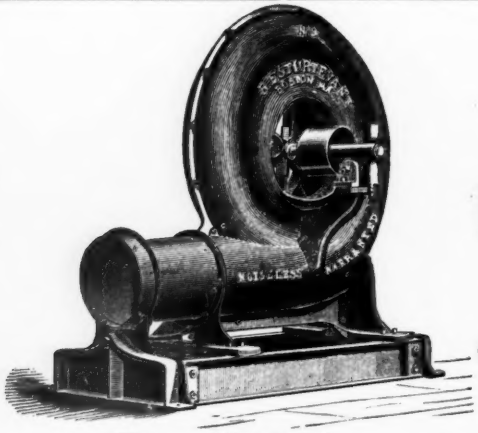

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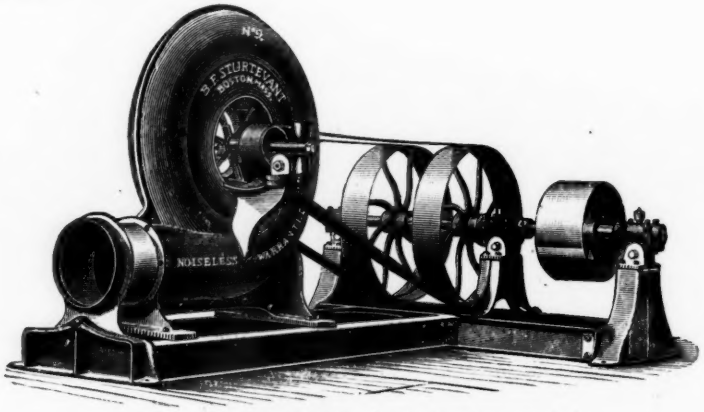

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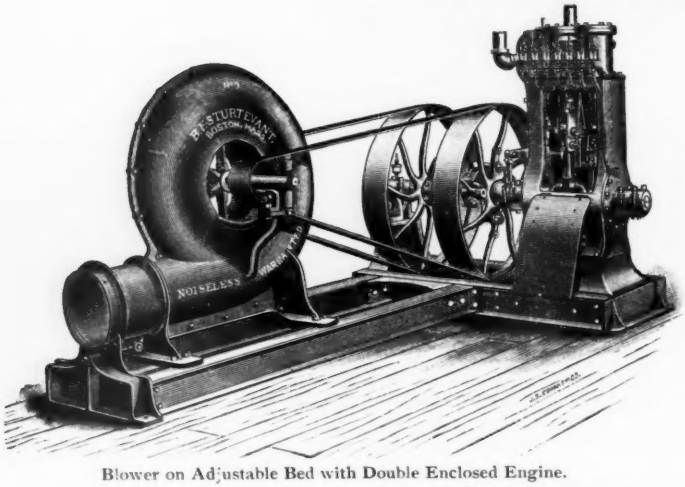

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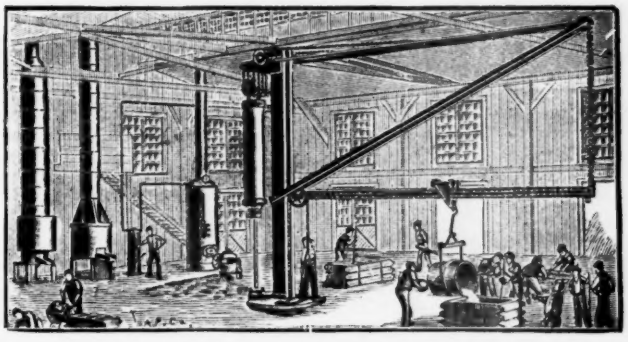

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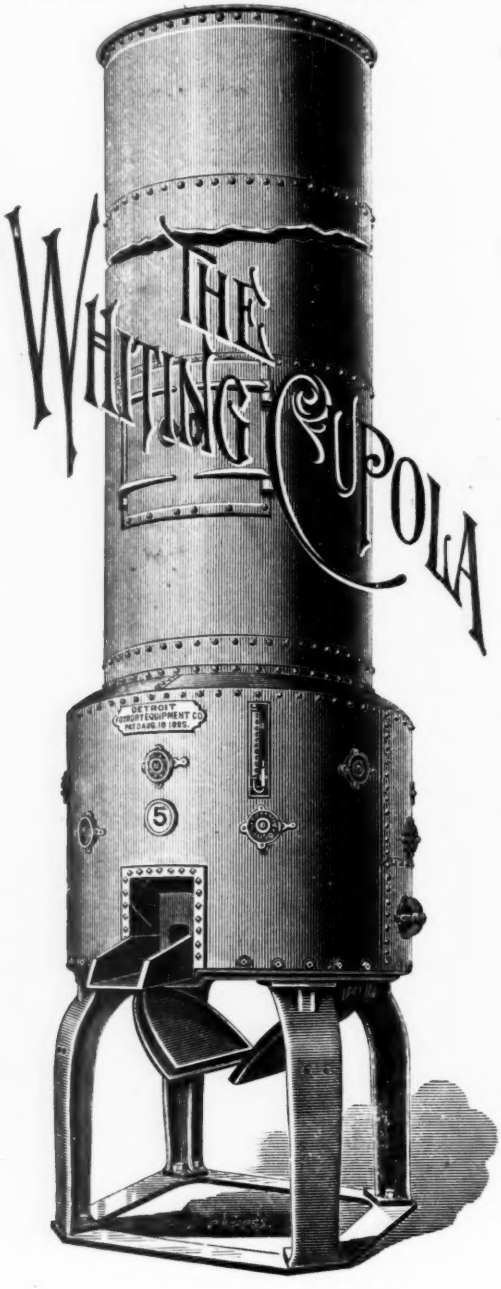


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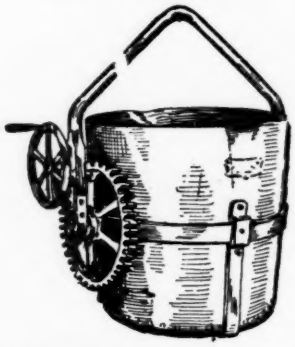

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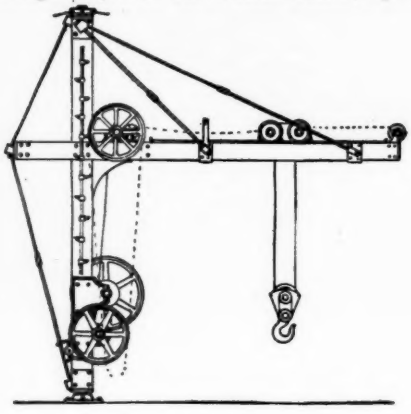


WRITE FOR ESTIMATES.

# THE FOUNDRY

VOL. I. DETROIT, MICH., NOVEMBER, 1892. No. 3.

## SOME THINGS BEYOND THE CAPACITY OF THE MOLDING MACHINE.

BY S. BOLLAND.

A CASUAL observer of the foundry business to-day, more particularly such foundries as make a specialty of match work, with and without the molding machine, would be apt to make a very serious mistake and imagine that brains were a superfluous commodity that need not be taken into account when the question of hiring molders was uppermost; and it would appear, at the places above noted that the molder has been reduced to a mere automaton or patent "Kodak," with this immense disadvantage, that before the button is touched for you to "do the rest" the operator must move considerable sand and perform an amount of athletics truly astonishing, clearly demonstrating the fact that no matter at whatever degree brains might be rated in this undertaking, muscle is most assuredly at a discount.

A little thought will serve to dispel some of the illusions which are apt to creep in whilst contemplating this interesting subject. All this remarkable display of muscular energy has most undoubtedly been forced upon us by the ever increasing demands of manufacturers for a larger number of castings at reduced rates, and is but the natural outcome of a healthy rivalry and legitimate competition by intelligent founders to secure the lion's share of this largely augmented business.

"The Molding Machine has come to stay," no matter how much opposition may be brought to bear against it, and, on the whole, I cannot see why there should have been such wide spread opposition to its more general adoption. Other trades have proved how utterly impossible it is to stem the tide of modern improvements in labor-saving machinery, it therefore behooves us to accept the inevitable and gracefully welcome the iron man as one of the "fraternity." Wherever the machine can be utilized for the production of castings, a truer and more perfect duplicate of the pattern is obtained in consequence of the absolute regularity and precision of the whole operation; the ramming or pressing of the sand around the patterns being in every instance the same, whilst the withdrawal of the patterns and the subsequent closing of parts insures a degree of accuracy impossible of attainment by the ordinary processes."

It is gratifying to notice that the various improvements in electric and pneumatic cranes are being taken advantage of around the molding machines, making it infinitely easier for the operators, and naturally enabling them to accomplish a larger amount of work. I am looking forward to an early application, to this industry, of some of the numerous admirable methods of mixing and conveying which might be readily adopted and thus aid in handling the immense amount of sand that must be used every day. "This is a consummation most devoutly to be wished."

Admitting that the molding machine has well established claims for recognition, and also, that superior castings, within certain limits as to magnitude and diversity of parts can be produced by its use, yet there will, I presume,

always be a very big margin of castings to make demanding the ripest judgment and calling forth the highest order of constructive ability for their successful accomplishment.

Scientific papers and trade journals hasten to inform their readers of the immense number of castings produced in an hour by the aid of some new contrivance, and every reflective molder gets a twinge once in a while when he learns of the almost superhuman efforts made by some one of his craft to "beat the record" and produce a larger amount of work in a given time than has ever before been accomplished, but we seldom hear much of the patient plodding and anxious hours, and weeks in some instances, which have been industriously spent to produce some of the very intricate and critical work that is being made in our best foundries every day.

To rightly determine who do this work is not a very hard matter, simply because the bad and mediocre molders constitute the large majority making it absolutely impossible for genius to fail in commanding attention, no matter how modest and unassuming the individual may be.

To have the confidence of one's employer or foreman is a source of inward satisfaction to any man, but, gratifying as this most assuredly is, it is as nothing compared with the infinite pleasure which accompanies a sense of your ability to help those around you who unfeignedly acknowledge your superiority and disinterestedly seek your aid. To command such proud distinction should be the aim of every young molder who aspires to a leadership among his fellows; but unless the aspirant for such high honors determines to master the first principles of his trade, no such eminence awaits him; he may rest assured that no amount of pretense or bombast will successfully take the place of talent when the latter quality is absolutely essential.

With the view of inculcating first principles in the minds of such molders as are anxious to examine into and obtain a more extended knowledge of these subjects, I propose taking up the several principles, one by one, using familiar illustrations in order to their proper elucidation.

When we say that a mold, in the ordinary acceptance of the term, consists of an upper, or cope part, in which the impression of the top side of the pattern is carried; and a lower, or nowal part, containing the impression of all the remaining parts of the pattern; we have perhaps, said sufficient to satisfy ordinary seeker after knowledge of a general kind; how far this generalizing comes short of the real thing can only be understood by such as are more or less skilled in the multitudinous intricacies attending practice of a higher order.

Aside from the special ability which enables the molder to manipulate the material out of which he fashions his mold, there is constant and imperative demands on a mature judgment coupled with a measure of constructive ability sufficient to enable him to carry and secure all the parts of his mold, not only accurately but with absolute safety; and be it remembered, he must meet every exigency entirely unaided by any of the "helps" which his more fortunate brethren in the iron industries can so easily avail themselves of.

Presuming that the student in these things has been correctly instructed in all that pertains to a knowledge of molding common objects, we will enquire into methods and principles called forth in the moulding of work greater in magnitude and more elegant in design. One of the chief essentials for molding the class of work above mentioned is to separate the mould into as many parts as will enable the workman to extract his pattern undamaged, as well as to leave his mold as free from fracture as possible; and at the same time easy access for finishing, setting and securing cores, etc., must be provided for.

As previously stated in another part of my work, it is much easier to accomplish all this in loam than in sand, for what might be a comparatively easy job, if done in loam, becomes at once a critical undertaking when attempted in green sand. It is to the latter class of work that this present writing is devoted.

Figs. 1, 2 and 3 represent cross sections of a class of work commonly met with in almost all of our tool and engine shops, the first being that of an ordinary Lathe Bed, whilst the latter may be taken for either Engine or Machine foundations. Choice has been made of these common objects simply because they offer the best opportunity for a review of the underlying principles which must govern the molder who essays the accomplishment of all such jobs, and the treatment of these will serve as a guide, and apply to all others of a like nature.

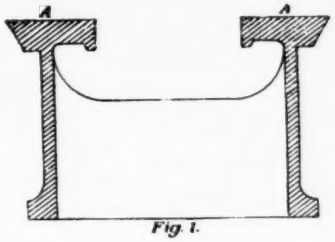


Fig. 1.

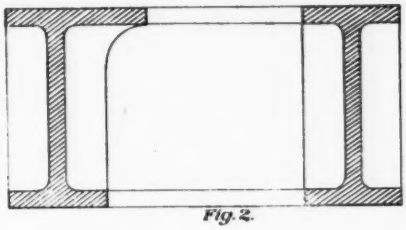


Fig. 2.

Fig. 3

Fig. 6.

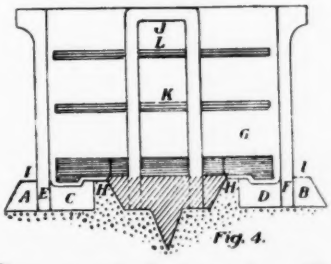
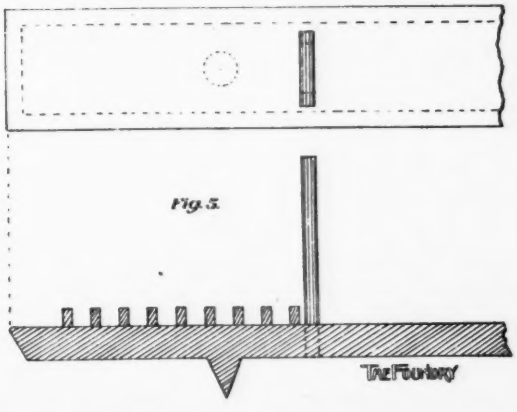


Fig. 4.




One great feature in all castings similar to fig. 1 is to obtain a perfect and clean surface at the parts A, A, and this can only be accomplished by casting the mold in the position shown at fig. 4. This method insures a comparatively clean surface at those parts, whilst the sullage, which always forms and rises into the upper parts of the mold, find a lodgment where it is less objectionable.

When the mold is wide, as in this case, and the outside projections, A and B, are narrow, the inside can be lifted out and the mold finished without much trouble; but to effect this properly we must first have those portions of the pattern marked A, B, C and D, made separate from the body, as shown at fig. 4, the body can then rest on the bottom surface of the mold and the loose pieces in suitable lengths for drawing, laid against it afterwards.

The reasons for this arrangement will be fully appreciated if it be understood that when the body of the pattern has been withdrawn from the sand, the core, G, can be lifted out with perfect freedom and the inside pieces, C and D, can be taken away without damaging the joint at H, H. The pieces A and B, can be then drawn inwards, the operation being materially facilitated by having ample draft at I, I.

So much for the general features connected with molding this job, but we have not considered how all this is to be done; the casting may be 12, or perhaps, 30 feet long; if the former length then one lifting plate would suffice, but in the event of the latter, it might be advisable to have two or more lengths of core, divided at convenient intervals at the cross bars. The principle of a lifting plate for this class of work is shown

in plan and side elevation at fig. 5, and an end elevation of the same is shown at fig. 4. In all cases plates of this kind must be made proportionate to the weight to be borne upon them, and due consideration must be given to such a distribution of the lifting handles as will insure the least amount of spring, or bend, in the plate.

All lifting handles should be made as wide as is practicable with a straight turn, as shown at J fig. 4; this allows of an easy adjustment of the hook and thus insures a straight lift on the core, something which cannot be as easily done when round eyes are used.

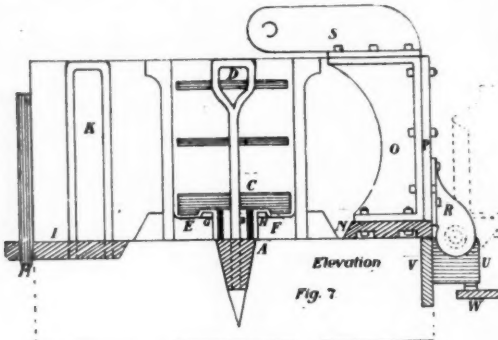
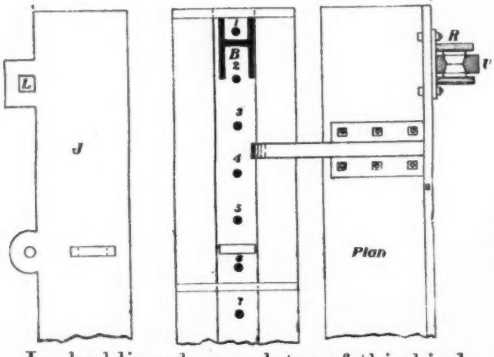


Fig. 7




In bedding down plates of this kind, great care should be taken to have them as much above the surface to be lifted as will allow the irons to rest thereon with only as much sand between as will permit of a solid bedding down of the iron. Too much care cannot be taken to insure a good job here, for it must be remembered that this is the foundation upon which all the weight of the core must rest, and no reliance can be placed on soft sand.

Additional stiffness is imparted to cores of this description by alternate layers of irons laid cross-wise during the process of ramming, as seen at K and L fig. 4, and all corners may be still further strengthened by an occasional gagger being set therein in a diagonal position.

Fig. 5 is a plan view of cross iron intended for use on such work; all edges next the casting are chamfered, but that portion which rests on the plate is left flat and some increase of thickness made in order to meet the requirements before mentioned.

An entire change of procedure is made necessary when this job is contracted in width. If the opening betwixt the sides is considered too small for safety in green sand, then recourse must be had to a system of dry sand cores but a reference to fig. 7 will show how a very small opening may, with safety be utilized in the moulding of such jobs in green sand.

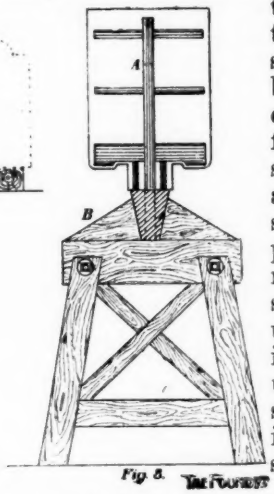


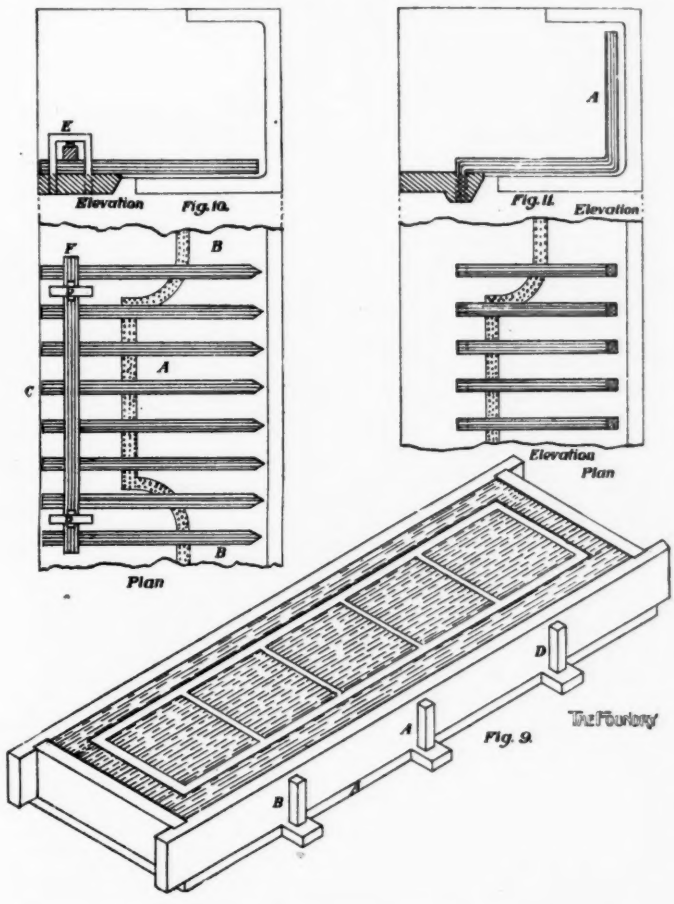
Fig. 8.

Several methods present themselves for overcoming this difficulty, first of which we will notice the one as previously explained, and made possible on such a reduced plate by setting the same with its upper surface on a level with the bottom bed, as seen at A, upon which surface are laid narrow strips of cast iron held together internal webs, as seen at B in elevation and plan, these standing a little above the surface to be lifted, allow the core iron, C, to rest solid thereon, making it impossible for any damage to ensue, no matter what weight the superincumbent core may be. The core is still further stiffened by the rods marked 1 to 6 respectively,

in plan fig. 7 and in end elevation at A fig. 8; these latter combine with the cross-irons and corner gaggers to make this core, narrow as it is, almost, if not altogether as firm as the one previously described. It will be seen at D fig. 7, how to make a wide handle on a single stem, and this particular item is worth remembering as it will prove very useful in a life's experience amongst this class of work. I need not mention that the pattern is to be, in this case, as for the last, consequently the pieces E and F are entirely loose at the first move of the core; thereby obviating all danger of dragging down sand at the neck, when the core is lifted out.

Should it be thought desirable to lift away the outsides of such a mold and leave the core standing, the iron strips B could rest on solid bearings provided for the purpose, and iron stakes could be driven down to answer the purpose of irons A, fig. 8. In all other respects the operations would be similar to those previously explained excepting, that on on account of pieces E and F having to be withdrawn after the sides were taken away, sufficient draft must be allowed to make the operation easy and safe, and the projections at G and H must necessarily be made loose to fall down after said pieces were drawn out.

Two important items in side lifting plates, or "drawbacks," merit some attention here, that if once properly understood, the rest is comparatively easy. First find out how much projecting sand is to be carried, and make the plate wide enough to allow the irons as much length back as will more than compensate for the weight in front; as seen at I and J, fig. 7. The other item is to so place the lifting handles, K, that a correct lift may be taken with the least amount of trouble. It will be seen that in this case the lifting handle, K, is set a little forward to make up for the extra weight on front, and also that the handle itself is wide, as before explained, and therefore any discrepancy can be easily rectified at that point.



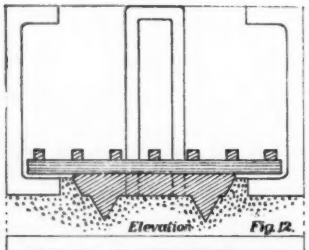

Ordinarily, a common drawback of this kind is rammed up and the hole entirely filled during the operation; to be subsequently dug around when the mold is to be separated, but if all of the cope be contained within the limits of the drawback's this extra labor may, in a great many instances, be saved by casting taper holes at intervals along the back of the plate, as seen at L, into which stout bars can be driven, as seen

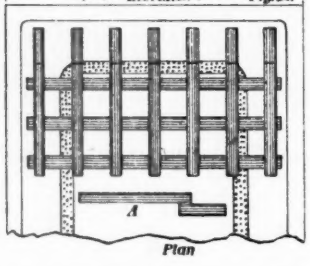
at M, fig. 7; these serve as supports for boards or plates, thus obviating the extra digging and ramming previously spoken of.

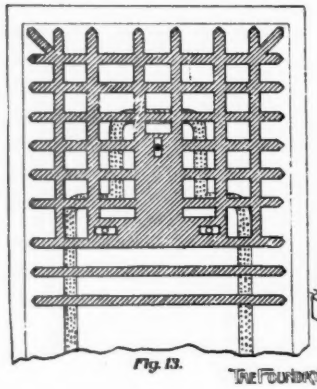
A careful scrutiny of the right hand side of fig. 7 will make it apparent that all this may be accomplished in a more elegant manner than has hitherto been suggested, but it must be observed that what we have been saying in reference to side plates is intended to apply only when the nature of the order would not warrant us in adopting more systematic methods at an enhanced cost.

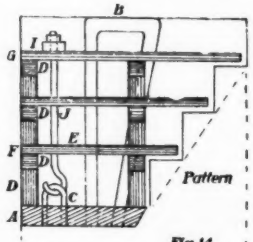
The rig shown consists of an inverted lifting plate, N, to which, by means of brackets, O, a back plate, P, is attached; the hinges, R, upon which the whole side is to be turned are placed at suitable intervals along the back plate, taking care to have them in close proximity to the brackets. The position of the check when turned up is indicated by the broken lines at T.

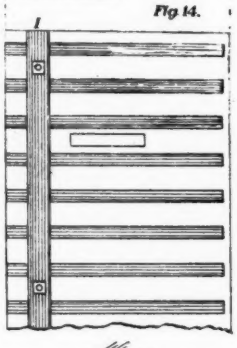
This method is very simple, as will be noticed. The bottom hinges, U, are cast fast to the long bar, V, this when cast is rammed firmly into the floor with its upper edge parallel to the bottom bed. Additional rigidity is given by inserting a stout bearing plate, W, and wedging under the hinge, as seen. The upper hinges are to be bolted on the back plate after all has been firmly secured. The fixing, S, is, in this case, necessary to obtain the required leverage for turning the side over on its hinges, and, as seen, is secured to the bracket by set screws at the top.

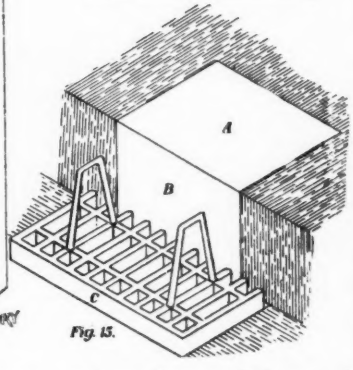



I have shown at fig. 8 how to rest long narrow cores, such as we have been discussing, the rig is simply a common wooden horse with wedges, B and C, nailed fast thereon; by this means the core can be safely housed and the finishing proceeded with as comfortable as if it were hanging in the crane.

When the jobs are not too ponderous and it is desired to reach every part of such molds, the method described at page 45 of "The Iron Founder" is most assuredly the best, for by the method there explained everything is contained within the limits of the flask, and all the extra labor involved by bedding in the floor is entirely saved.

I have shown at fig. 9 a cheap makeshift for small jobs of this class; this whole outfit consists of a plate, A, cast in one piece, on which is placed a wooden frame stiffened at the waist by iron bars, B, C and D, after the manner as before explained at fig. 7. This frame may be fitted with a wood cope, or

an iron one can be used temporarily if the order will not allow of an entire iron rig being made.

It sometimes happens that projections occur at certain places along the length of foundations, etc., which if provided for by the methods as previously described, would necessitate the use of some very unwieldy plates. Fig. 10 illustrates how such a difficulty may be overcome by a very simple arrangement; the figure includes plan showing the wide projection extending from the regular web, B, B; it will be seen that the back of the lifting plate, C, has not been made wider at that point, thus making the surface to be lifted at, A, very much wider than the lifting plate itself, which, if not provided for would inevitably collapse when the plate was lifted away.

The staples, E, seen in end section above, are cast in the lifting plate in the position shown at D, D in the plans; and, as shown in the figure, serves the purpose of wedging down the bar, F, seen to rest on all the irons, and thus securing them firmly to the plate. By this means the irons become as one with the plate, and absolute safety is assured.

Fig. 11 shows how the same results may be obtained by casting irons in the lifting plate, but for general purposes the other mode is by far the best, especially when the rig must be used more than once. The crank end at A can be made very useful on special occasions, and materially helps to stiffen a critical corner that would otherwise be dangerous to risk in green sand.

Fig. 12 represents a piece of work when the web extends round the end of the plate for lifting out the inside. A very neat and effective method of carrying such a core is here shown; the cross irons extend to within a short distance of the end of the plate, and the remaining portion is cared for by the crank irons, A, set in at right angles to, and resting firmly on the cross irons.

The conditions on such a job are very much changed when the inner web is widened as shown at fig. 13. This emergency is well met by introducing a grate, or "grid," cast for the purpose, which, as in all the other cases mentioned, must have a sure rest on the plate, to which it must be firmly secured by bolts at the holes indicated. When from any cause, whatever, the plate does not stand high enough to rest the grid upon, then recourse must be had to packing; as in all cases of this nature we must have iron and iron; a strict adherence to this rule will save many a blunder.

Fig. 14 shows how to carry away a deep overhanging side in green sand and is simply the application of the principle set forth at fig. 10. The section of lifting plate, A, with handle for lifting, B, also staple, C, for securing is shown; on which studs, D, for the support of bars, E, are resting. On these bars the first row of irons, F, are seen in position. The same process at the two upper tiers brings us to the top row of irons, G, on which the bar, I, is placed and securely anchored; the bolts, J, having been previously set in position before the ramming commenced. The value of this kind of lifting handle is again forcibly demonstrated in this instance, as by changing the angle a little almost every inequality of weight may be provided for.

If a side must be carried away exposing a web, or projection, of more than ordinary dimensions, it is just as well to make a flask drawback to cover the whole thing; this will serve the double purpose of fitting the lower surface and carrying away the side. Extra precautions must, in this case, be taken to provide suitable bearings at each corner of the flask; these must rest on anchor plates set down solid below the mold. Fig. 15 is the representation of just such a mold as would require the arrangement we have been describing. At A, we have the surface level with the floor, whilst the surface B, at right angles to A, extends to another similar surface directly under the flask C. With such an arrangement as is here illustrated, such work, difficult as it may seem, becomes comparatively simple.

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CHURCH M'F'G CO.
Morenci, Mich.

## STOVE PLATE FACINGS.

BY CHAS. D. PEET.

THE proper use and manufacture of Stove Plate Facings in this country have been the source of much vexation among Stove Plate and Architectual Iron Molders for some time. This is is the result of close competition and the earnest efforts of all ornamental iron workers to excel in turning out silver plated castings has given a marked impetus to the manufacture of fine high grade facings.

Almost within the recollection of the writer the equipment of every stove foundry was not considered complete without the primative "facing room" with its mortar and pestle, or in a more progressive shop, the Ball-mill, but since the advent of the numerous foundry supply houses with their new and improved machinery for the manufacture of perfect facings and their ponderous mills, separators, bolters and refineries, the facing mortar has been converted into a parting sand pot, the glory has departed from the pestle forever and the muffled thud of the Ball-mill is heard no more.

It is not the intention in this article to review the numerous improvements made in the mixing of Stove Plate Facings. This has long since ceased to be a secret, and the modern facing mill does not grind behind closed doors. There was a time when every foreman or molder had his own secret formula for preparing his heavy facing, or blacking, which he guarded with jealous care, there suiting the facing to his own individual notions. It is all very different now. The first and prime object of every facing manufacturer is to suit the facings to the sand used, thereby insuring good results in "returning," or printing back, and a smoothe silvery surface, free from "wash marks," "scars," "rat tails" and other dire effects of antagonism between the sand and facing. Therefore, if the facing suits the sand, it is bound to suit the molder, unless he be ignorant or prejudiced.

Sand for Stove Plate Molding is generally found to be open or close, according to the location of the banks from which it is taken. It is also richer in silica or alumina for the same reason. The closest and finest sand in this country comes from Albany and vicinity. The more open sands are found further west. It is in view of these facts that we facing men meet somewhat of an obstacle, not from the facing which we furnish these two localities, but generally from the molders themselves.

The body of all Stove Plate Facings is Graphite, more commonly called Black Lead, or Plumbago—not that lead enters at all into its composition, but probably from the leady or silvery gloss which it shows when rubbed between the fingers, or slicked with the tool. Graphite, or carburet of iron, is one of the most refractory minerals known, hence its value as a facing body. But Graphite in its pure state is extremely sticky, not as we would term molasses or glue, but some peculiar property of its own causes it to adhere to the sand directly under the pattern and also to the pattern causing small particles of sand to stick to the pattern when it is withdrawn for the second time after printing. To overcome this difficulty the moulder of the past was obliged to dust on the top of the heavy facing a slight coating of charcoal or other dry substance. This separated the pattern from the heavy, or sticky facing, and while it answers this purpose admirably did not affect the appearance of the casting as it was immediately dissipated on the molten metal over it. The heavy facing being Graphite or carbon of one form, unites with the water in the sand forming an oxide on the surface of the casting, or in other words a skin, or veneer. This veneer is called magnetic or black oxide of iron, from the union of the carbon in the facing and the oxidization which is formed on the casting by the decomposition of the water in the sand. On the successful deposit of this veneer depends the appearance of the casting when cold.

Pure Graphite is uncertain in its action in Stove Plate Molding inasmuch as it is liable to stick, through careless handling, and the molder's time and labor are lost. In close fine sand this difficulty is easier to overcome

than in open sand, as less facing can be used, the sand itself making a smoother face than sand which is more open. In open sand a different kind of facing is required, because if pure Graphite were used it would be necessary to dust on larger quantities to fill up the crevices in the open sand. While a liberal use of the pure material would attain the desired effect, as far as silvery appearance is concerned, the difficulty of getting the pattern out without sticking would prevent its use and returning in imperative in all fine castings because heavy facing will wash if not pressed into the sand evenly by returning or brushing.

For use in open sand the leading manufacturers of facings are grinding a mixture which not only contains Graphite and other refractory substances in its composition, but others which altogether overcome the undesirable sticky quality. On top of this mixture are used what are now termed patent return facings. Top, or return facings are said by some to be an evil from the fact that early experimenters put on the market mysterious compounds which washed before the iron and behaved in such annoying manner as to somewhat discourage the foundrymen who used them. These evils have long since been overcome by using ingredients that have such an affinity for Graphite that they will lay where they are dusted and the hottest and most fluid iron has no effect upon them.

It will readily be apparent to the observing stove plater why the Eastern molder "kicks" at our Western facing, and vice versa. The Western molder goes into the Eastern shop, puts up his first mold, slaps on twice as much facing as the sand will stand and when the castings are discounted by the inspector, or he cannot pass them on account of eastern facing, washing or sticking and spoiling his work, he never stops to think it is his own carelessness in applying them, for they are close sand facings with which he is not familiar. So with the Eastern molder in the West. He has been used to dusting on a spare coat of heavy facing and a thick dust of charcoal. He tries his old method. The sand is open, the heavy facing being less rich in Graphite, fails to hold the excessive amount of return facing, and the result is the same as in the case of his Western brother. The evil lies not altogether in the facing bag, but in the man who uses it.

Another great evil is the use of that arch-enemy to fine castings, the parting-sand bag. Of this evil we prefer to say nothing for obvious reasons. Every molder is as familiar with it as he is with "Gumbo" and like abominations. If the time used in shaking the detestible parting-sand bag over a good mold were spent in a slight but effective application of the pattern brush, what infinitely better results might be attained!

## THE RELATION OF A FOREMAN TO HIS MEN.

THE relation a foreman should bear to his men is a subject full of interest to all who are placed in charge of others as well as those operating under them. The impression prevails that a foreman's duties consist largely in the execution of his plans, carrying out the views of his managers and filling a sort of autocratic position above those placed in his charge, maintain a gulf between them across which none shall venture by becoming too intimate, and keep his men in constant fear of the awful consequences of breaking down the barriers that exist between them. Now, the subject properly considered, is a deep one, and one that should not be lightly glanced over and passsd by with a comment only. The fact, that a scarcity exists of good foremen, and the lack of competent men qualified to fill foremen's positions is shown by the advertisements in the papers and the general complaining heard on all sides, the demand is for men of intelligence, character and reputation for ability, who are honest and sober. The character of a foreman who is thoroughly qualified, and who can be designated by the word "good," may be divided into many subdivisions. He must possess in his relation to his men, and employers also, a composite character, capable of surmounting the varied difficulties ever coming up in the daily routine of work.

His education and experience should enable him to grasp the character and scope of the business in his charge, he should be able to concentrate all his thought on the work in hand, and look after the details with care, ease and certainty; he should be painstaking in the extreme and have such a degree of affection for his work as will inspire him to look after every minor consideration; he must possess patience, have a quiet but determined manner in giving his instructions, and above all things, possess the faculty of cultivating the confidence and esteem of his men, as on this alone, may, perhaps, rest his entire ability to succeed. He should at all times encourage new and original ideas among his men, as there is no one thing the average man is as jealous of as his idea, and when suggested to the foreman and then carelessly cast aside by him, it is sure to lead to diminished respect for rules of shop management and a lessening of that interest every man must have in his work if he is to succeed. It should be the policy of a foreman to encourage originality on the part of his workmen as it leads to thought and study, and if he finds it advisable to reject their suggestions, let him do so pleasantly. He should allow any approach towards personal familiarity with his men in shop hours and while he must maintain a measure of dignity, it must not be too marked, how many of us have keenly felt the cutting manner of the proud and disdainful foreman who "knew it all?" who cared nothing for other's ideas and never used them, being satisfied with his own superior knowledge and gave no thanks for any suggestions, and how many of us have done work repugnant to our mechanical sense, yet compelled by a "know it all" foreman, who was so puffed with his own conceit as to forget that a workman will often see a "short cut" which a busy foreman will overlook. No foreman is obliged to use any other than gentlemanly and reasonable means to arrive at the maximum productiveness of his men, and nothing is gained by the use of coercion, force and profanity to grind work out of his men, it is not necessary, it is a slur and a satire on the intelligence of our American mechanics to do so. The solution of the problem of how to succeed is more apt to be found in kind, proper treatment of each man, contentment in his place, and a knowledge that the foreman relies on his manliness, honor and ambition to promote the best interests of his employers and has a due regard for short-comings, will go a long way towards adding to any man's productiveness.

Few foreman are found who are sufficiently explicit in giving explanations in a full and painstaking manner, too many say once what they want and leave much (not told) to be guessed at by the judgments and ingenuity of the workman, who perhaps, but partially understands the work in hand; the painstaker will tell and tell again, if necessary, and his man if not sufficiently sure will not be afraid to ask questions. No foreman should have his favorite to whom all the best work goes, the bane of his life will be that favorite, who will engender malice, hatred and create disturbance by his actions, his independence in the shop, and his assumption of authority at all times; all men should be treated alike if the best results can be expected.

Then there is the apprentice. This youthful operator should have his mind so moulded by constant attention through his foreman, as to become ultimately a capable and pushing mechanic, and the policy of every foreman ought to be to inculcate good ideas of the craft into their mind by patience, explanation and example, to enable them to become useful members of the trade, and by example, to instill into their minds the necessity of certain things, that they may become successful mechanics. Managers pursuing the plan of keeping their apprentices up to the standard, and when their apprenticeship is over, to hold them as mechanics and workmen, soon gather around them capable men, well acquainted with the peculiarities of the place and work, and trusty workmen who will carry to success any and all projects entered upon by the managers and entrusted to them for execution. But the foreman whose short ways, cutting speech and general

carelessness of the outcome of the apprentice, as shown by his indifference to them, is going to prove himself a poor man for the position, in the long run. The cordiality, frankness and congeniality of a foreman has much to do with his success and his personality, magnetism and attachment to his men, will aid in securing the co-operation of the most stubborn of employees. No man will hinder a foreman whose aim is to forward the work by systematically planning, managing, and collecting the fog ends of a piece of work, that the workmen may intelligently understand what is wanted of him and who, when approaching a workman, knows just what to do to gain his co-operation pleasantly, cheerfully and completely. The requirements of a foreman to properly handle the wide range of characters found scattered through an establishment and carry the work forward in a way to keep everybody good humoredly up to his fullest pitch and at the same time secure a profit to his employers are trying, and the required stock of ability is hard to find, but there are, without doubt, plenty of men capable to hold responsible positions and who need the chance only. Every man who rises comes from the ranks, and every foreman was once a journeyman and once an apprentice. Too much respect for all these things cannot be given, and the establishment of a perfect unity, cooperation, and mutual exchange of courtesies in the shop will be productive of the greatest good for the greatest number.

## FOUNDING AND METALLURGY.

### As Practiced in the Early Part of the Last Century.

Continued from October.

Translated from Reaumur for THE FOUNDRY by N. DANTERVILLE.

NOW, why does this operation render iron capable of taking a hardness similar to steel? When I sought to find this out, I discovered that it is because it converts to steel the first layers of iron. Therefore, the files of iron act the same as those of steel, their teeth are steel, like the steel files. Experiments, useless to recite here, entirely convinced me of the change of that part of the iron to steel, to which the workmen paid no attention, they really make themselves tools of steel and they think them of iron. The conclusion that I drew from this observation, is, that the materials employed for the prepared baths (Trempe en paquet), might be the base of compositions suitable to convert iron to steel; that if those, who temper by these preparations, gave a fire of greater length to their pieces, they would render them steel throughout; this would be entirely unnecessary with the tools of which we have spoken, which do not need to be hard except in the first layers; but the remark was essential to me, who sought to render bars of iron entirely steel.

The base of the compositions employed for the prepared baths (Trempe en paquet), are pounded coal, some ashes, some soot, which are seasoned with salt and which are mixed with different matters, be they vegetable, be they animal, be they mineral.

The secrets instructing how to convert iron to steel refer quite often, for the ground work to these compositions; but each workman has his favorite ingredients which he uses; he has his particular doses of which he makes a mystery.

After all, even if each workman of Germany, of England or other countries had communicated to me their compositions, I would still have attempted the experiments which I will describe in the following:

I would not have spared a single one, independent of the interests of the kingdom (France). The matter was important enough in itself to merit, to be examined thoroughly.

It was necessary to assure myself if the ingredients which they employed were the best, if they could not substitute others, the effect of which would be more sure, or more prompt; to assure myself, for example, if certain salts merited the preference in which they were held; if they did not neglect others which could be employed with more

success; if they did not use in these compositions some substances which should be left out as detrimental, or, at least, as useless. It was necessary to be able to determine the exact doses of each matter, to search if there were not means attainable to make steel something better than that which is made today; to see how far the perfection of steel could be carried. In a word it was necessary to reduce to rules the manner of working the conversion of iron to steel, to make it a known art, easy for workmen to follow.

But it is an art which it was necessary to invent before it could be described, which could only be attained by a number of experiments which seemed prodigious, I have dared to attempt them, and I shall be well satisfied with the work which they cost me if the public reap of them some advantage. To report the experiments that I made and the observations which they furnished in an order suitable to instruct, I shall divide them into different memoirs, which will be so many parts of our art. The first part of this first memoir will be solely employed to make known the road that I followed to discover the compositions, the most suitable to convert iron to steel, it will then show what are those compositions; it will reveal the mysterious part of our art. The second memoir will contain only general observations instructing how to regulate the fire properly, and whatever is necessary to prepare for the third and fourth memoirs, one of which will instruct how to make trials of steel on a small scale, and the other will explain the construction of the furnace and what has reference to them. In the fifth we shall try to characterize the iron of the different species with regard to the dispositions which they have for being converted to steel. We shall give in the sixth some observations on the changes which are made in the iron during its transformation, and a result of what it costs to operate it.

We shall profit of the knowledge which these observations will have given us to establish the qualities which distinguish iron from steel, in a clearer manner than has been done hitherto; we shall try to do so, be it by the composition, be it by the decomposition of steel, be it by the anologie which is found between the different ways of making steel immediately from the castings and the ways of making it with forged iron. It is to what are destined the seventh, the eighth and the ninth memoirs, they will also contain some instructions which will not be useless in the practice of our art! In the tenth we shall be able to give some means of judging of the perfections of the different steel and of making a comparison of them. In the last memoirs we shall try to explain the effect of the trempe, we shall examine the different sorts of trempe and of amealing metal and we shall erect on this matter, important enough in the practice of the arts, as many as we can. But return we to the first part.

We have then proposed to report in this first memoir only the experiments relating to the mixing and to the dose of materials which enter in the composition which seemed to us the more sure for changing iron to excellent steel; although it is the secret part of our art, it is not that which is the most interesting, it is only on account of different attempts which we would willingly avoid relating if this account seemed to us less essential. Many of the attempts which we recount have not succeeded, we have not, however, thought that it is less necessary to make mention of them than of those which have succeeded better; they will save others the toil of repeating them, or at least, they will learn the degree of success which they may expect. It is nearly as important to know the materials and the dose of materials which should be rejected, as to know those which should be employed.

(*To be Continued.*)

## A REASON FOR IT.

DENNIS.—What made the men strike? Did they want more wages?

OCH.—No sor, it wus just this; some wan sed the walkin dilegats wasn't earnin' his money, an he heard it, an so he ordhered us to shtrike.

August Miller, a brass molder from Chicago, can receive information of value by calling on the Police Superintendent at Buffalo.

# THE FOUNDRY

A TECHNICAL JOURNAL DEVOTED TO FOUNDRY INTERESTS.

*Published Monthly by*

"The Foundry Publishing Co."

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JOHN A. PENTON, - - - - - SEC'Y-TREAS.

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THE FOUNDRY is issued promptly on the tenth of each month, and will spare no endeavor to furnish valuable news and information to those interested professionally or incidentally in molding, melting, mixing of metals, foundry management, etc. Persons connected with any of these lines of industry will confer a favor upon the Editor of this Journal by sending him news from their section of the country pertaining to the foundry interests, particularly individual theories and experiences of practical value.

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## INCRESAING USE OF STEEL CASTINGS.

THE *Iron Trade Review*, of Cleveland, O., is showing a commendable piece of enterprise by sending out a number of circular letters to parties who are interested, inviting their opinion as to the probable extent to which the increased use of steel castings is likely to effect the foundry trade, etc., and propose to publish the result in a future number of that valuable paper. One opinion, that of Mr. John Walker, of the Walker M'f'g. Co., of Cleveland, we give herewith:

"Steel castings are taking the place of ordinary castings and forgings, in a great many instances, especially in guns and gun carriage works, marine engine framing and bed plates, stakes for hydraulic riveters, large gears for cable railroad machinery, framing for hydraulic presses, punches, etc."

Asked whether the results were such as to indicate that steel castings would find an increasing use, Mr. Walker replied:

"Yes, and especially so as care and attention are given to clean and good castings, by those engaged in that class of work. The quality of steel castings has been very much improved during the last two years. We recently tested a broken steel casting, expecting to find it defective in quality, but to our surprise the tensile strength ran a little over 80,000 pounds per square inch, proving at once that the machine had been entirely overtaxed, and that the material was not at fault."

## BUSINESS IS GOOD.

WE give space elsewhere to a letter from a Bay City, Mich., correspondent, who commences by discrediting the encouraging reports published of late by commercial agencies, etc., as to condition and outlook for the iron business generally and foundry business in particular. It is worthy of note in this connection, that following up his own rather pessimestic views, he immediately commences to picture a roseate view of the condition of trade in his own locality, which is all the more significent to anyone acquainted with the facts, as business in Bay City has not been all it should be during late years. THE FOUNDRY feels it to be its duty to take issue with its correspondent in that particular. Business has not been better in America for over ten years than it has been during 1892, and there is nothing in the present outlook to warrant the belief, that all things considered, it will not be

even better during 1893. The political aspect of the case, in our opinion, is not a very weighty one, judging from the comparative apathy of the campaign and no matter what its result we believe the outcome will not greatly affect the general result.

Before this issue reaches our readers the matter will be settled largely for another four years, and it becomes the duty of every loyal American citizen to maintain an abiding faith in the future prosperity of the greatest manufacturing country on earth and he who has the most confidence in this respect coupled with due caution will fare the best.

## THE FOUNDRYMENS' ASSOCIATION.

ALTHOUGH, only in existence but a short time, comparatively speaking, the Foundrymen's Association, whose headquarters are in Philadelphia, have been instrumental in accomplishing much good. This has been chiefly noticeable, probably, through its having brought home in a most forcible manner to all of its members, the evils from which the foundry business has been suffering for many years past, and the discussions which have taken place at the many meetings which have been held, bear evidence of a desire on the part of the association to do all in their power to secure more favorable conditions and lessen ruinous competition. This, however, is of minor importance in this movemement as far as its future usefulness is concerned, though most essential for its present existence as furnishing cause for thought and action. The fact is that foundrymen in all the large trade centers of the country are watching with much interest the work of their Philadelphia brethren and all that is needed to bring, not only into active existence many associations founded on similar lines is the assurance that the Philadelphia Association has been a success in its work, and that what it has undertaken has been in a measure accomplished. To those on the outside it has seemed doubtful whether men who were in active competition with each other in business could be induced to co-operate to do away with some of those evils connected with that very competition in which they were such energetic participants, or in other words whether it could become universal strong and influential enough to exert any force in the required direction. The evidence at hand is in favor of the association, notwithstanding all the discouraging circumstances which have confronted it on the start, and as soon as it can be shown that this is so beyond doubt, many others can be looked for, and in all probability, a national organization will result. As an evidence of what is being done in this direction, we reproduce the following circular which is being distributed by the State Department among certain of its foreign representatives:

DEPARTMENT OF STATE,
Washington, Oct. 6, 1892.

*To the Consular Officers of the United States in England, France and Germany.*

GENTLEMEN:—The Executive Committee of the Foundrymen's Association of Philadelphia has requested the department to secure through your good offices, certain information concerning the founding of metals in England, France and Germany, to wit:

1. Is there any combination, association, or understanding among ironfoundrymen for the regulation of the selling prices of their product?
2. What are the average wages paid for the different classes of labor in iron foundries?
3. What are the average prices paid by foundrymen for iron; fuel, sand and other materials required by them?
4. What are the average selling prices of the following different classes of iron castings:
   (*a*) Loam casfings.
   (*b*) Dry-sand castings.
   (*c*) Green-sand castings, composed of light castings weighing less than 500 pounds and heavy castings weighing over 500 pounds.
   (*d*) Chilled-iron car wheels.
   (*e*) Cast-iron water and gas pipes.
   (*f*) Steel castings.

In compliance with the request of the abovenamed association, you are severally requested to prepare a report covering the interrogatories given and transmit the same to the Department at your earliest convenience.

I am, gentlemen, your obedient servant,
ALVEY A. ADEE,
Second Assistant Secretary.

## THE FOUNDRYMEN'S ASSOCIATION.

THE FOUNDRY has received the report of the seventeenth meeting of the Foundrymen's Association which took place at the Manufacturers' Club, in Philadelphia, on Wednesday evening, October 5, a large contingent of members being present. The chair was taken by President Francis Schumann, and after the routine reports from the secretary the principal business of the meeting was proceeded with, viz.: the nomination of officers for the ensuing year. The following names

were presented unanimously, viz.: President, Francis Schumann, of the Tacony Iron and Metal Company, Tacony, Pa.; Vice-President, Thomas Devlin, of Thomas Devlin & Co., Philadelphia; Treasurer, Josiah Thompson, of J. S. Cassin & Co., Philadelphia; Secretary, Howard Evans, of J. W. Paxson & Co., Philadelphia. For Executive Committee, Walter Wood, of R. D. Wood & Co., Philadelphia; Thomas Glover, of Glover Brothers, Frankford, Philadelphia; L. B. Whitney, of A. Whitney & Sons, Philadelphia; A. C. Vansant, of Morris, Tasker & Co., Incorporated, Philadelphia, and Stanley G. Flagg, Jr., of Stanley G. Flagg & Co., Philadelphia.

Mr. Evans tendered his resignation of the office of Secretary, and intimated a desire that he should not be re-elected to that post, on account of business exigencies which made it almost impossible for him to devote the necessary time to its duties; but on the urgent request of the members present Mr. Evans consented to reconsider his decision. Several speakers testified to the good work done by him in the arduous post of secretary since the organization of the association and his untiring efforts for its success, and pointed out that the loss of his valuable services at the present stage of its existence would be most serious and detrimental to its well-being in every way. The association is to be congratulated on the prospect of retaining Mr. Evans' services for another year at any rate.

As an illustration of the interest which the Foundrymen's Association has aroused, it may be mentioned that the Secretary of State has volunteered to obtain from the United States consuls in Great Britain, France and Germany all the information they can collect in regard to foundry practice, prices, wages, &c., in those countries, and, by his desire, a list of questions to be answered by such consular officers has been prepared by the Executive Committee of the Association and forwarded to the State Department accordingly. It is hoped that much useful information may be thus secured.

The association has during the initial year of its existence already accomplished a large amount of good in the lines on which it was founded, viz: the advancement of the foundry trade in the United States. A mass of valuable information bearing on the business has been gathered from various sources, which will prove of great value to foundrymen in general, and much benefit has accrued from the ventilation of matters of interest to the trade in the meetings of the body.

The association now numbers about 100 members, and, as it is national in character, it is hoped that many more from all parts of the country may join its ranks and thereby benefit themselves and the foundry industry in general, by associating for mutual protection and the advancement of the foundry interest.

The address of the Secretary of the Foundrymen's Association is, Care of J. W. Paxson & Co., Pier 45, North Delaware avenue, Philadelphia, Pa.

## THE WOODRUFF PATENT SEPARATING MACHINE.

THE Woodruff Patent Separating Machine, whose advertisement appears elsewhere, is the outcome of the demand for something that will save the immense waste that but few foundries pay any attention to and which is found in the amount of iron frequently thrown away with cinders from the cupola. We clip the following from a small, neat catalogue issued on the subject by the makers:

"The inventor and patentee of "The Woodruff Patent Separating Machine" has sold a large number—nearly two hundred—of these machines solely by personal visits and representation. We have a great many letters commending them from malleable iron manufacturers, stove manufacturers, car wheel manufacturers, hardware manufacturers and general iron founders." "Can be set up and started by any ordinary mechanic. It can be successfully operated by any laborer who is intelligent enough to ship a belt, use an oil can and shovel the refuse into the screen or hopper. If you are not equipped with cinder barrel, the saving affected by this machine in connection with such a barrel will pay for both in a short time, in spite of present low price of iron."

"A barrowful of refuse will pass through the separator in three or four minutes, all the iron being deposited in box provided for it, and all other materials thrown to rear of machine."

## PATTERN LETTERS.

WE take pleasure in calling the attention of our readers to the advertisement which appears elsewhere, of H. W. Knight & Son, Seneca Falls, New York, manufacturers of Pattern Letters and Figures. This firm make a specialty of these goods and issue a neat catalogue, which gives a very good idea of the many styles they keep in stock, prices, etc.

## STEEL MOLDING.

(Third Paper.)

BY JOHN PETTIGEW.

IN my last paper I gave a few examples of the bother we had, caused by the great shrinkage of steel when in an almost semi-fluid state, and incidently mentioned the great strain there is in all steel castings when cold. Of course, in all works like these there is a great deal of scrap to break up, especially old moulds and steel scraps, heavy ladle sculls and old machinery for which heavy drop balls are used. These had been made of cast iron, but they wore out very quick and was almost a constant job in the foundry, so we tried them of steel. These are made nearly egg-shaped with an eye bolt cast in the longest end. Some of the first we made stood the drop very few times, breaking in two at the greatest diameter. Others again would spawl off in leaf like flakes about half an inch thick and would continue spawling off for as much as three inches, the fracture between every one of these flakes being nearly smooth, We had the cast iron ones break in two before, especially when made of hard iron, but the flaking was something new. To try and get over these difficulties we tried to anneal them, using an oven that had been built for case hardening. Letting the ball nearly cool in the mould we would put them in the oven and fire hard for from 16 to 20 hours, after which we would make the oven as air tight as possible and let them stay in till nearly cold, this was very successful, so much so that a drop ball is rarely made now, they stand so well. We found that our castings would stand so much better, especially those subjected to sudden blows or strains when they were well annealed. That when we were making nothing but hard or rail steel we annealed everything, thereby saving a great many castings that were otherwise apt to fly when in work. Another good result of the annealing was, that castings too hard to work in the machine shop before being annealed, if carefully cooled, excluding air as much as possible, could be machined with comparative ease, but if exposed to the atmosphere the skin was almost impossible to break. There is scarcely a pattern comes into the foundry for steel but has to be treated for shrinkage cracks in a different way. We have quite a large number of table rollers to make that give us a good deal of trouble, they are 9 inches in diameter and 7 feet 6 inches long with a hole in each end 4 inches square, the body of the roller is only $\frac{3}{4}$ of an inch thick with a heavy piece on each end 9 inches long, they draw apart where the heavy end joins the light part of the casting 9 inches from the end. There are two causes operating to produce this cracking, the length of the walls of the moulds and the shape of the core, the length of the mould holding the outside of the casting and the inside core keeping the heavy ends from following the lighter body. The only way we have found to fix this is to cast fins or wings around the roller, about 6 on each end. This being thin at the outer edges set very quickly and pull the heavy part along with the body of the roller. If the steel is very hard these wings would be better carried along the whole length. Of course, they have got to be cut off when dressing the casting. We got into a way of casting these ribs or wings inside of the roller, which helped strengthen the casting, as they have very heavy work to do. I see in some places the same plan is adopted on the necks of the heavy pinions used in driving roll trains, but we have had no trouble with them, fixing the flask in which they are cast so they can be relieved easily and tapering our risers so there can be no hold. I understand in some shops there are sheet iron shells used on work like the two last pieces mentioned, the theory being the steel in contracting will slide in the shell, or that the surface of the casting will be made stronger by the adherence of the shell. We have never seen it done and therefore cannot say how successful it is. Since writing the first paper I have seen an article in the *American Manufacturer*, translated from the French, which I think will be interesting information in connection with these papers and as they are meant to help every person who wishes to use the information, the way it is done in France might prove better than the way

we do it here. The article in question is as follows:

In *La Metallurgie* M. L. Camfruden discusses the subject of molds for casting steel concerning which so little is known. We are indebted to the *Colliery Guardian* for the translation. We have condensed the article somewhat.

Coke enters into the composition of most of the molding sand used, to which it communicates a certain porosity which favors the passage of the gases. The coke also absorbs part of the moisture, which tends to keep the sand in good condition. For steel foundry purposes the purest kinds of coke are always the best. The composition of coke of suitable quality is about as follows: Carbon, 92 per cent; ash, 5 per cent; oxygen, nitrogen and hydrogen, 3 per cent. The preparation of the coke is most simple. It is broken with the hammer, crushed in a mill and sifted. It is then ready for the sand.

PLUMBAGO.—Artificial graphite which attaches itself to the retorts in which the distillation of coal is carried on for obtaining lighting gas is a black hard substance with a density of about 2.1. Broken, pulverized and sifted, like coke, this artificial graphite is of great use in the preparation of sand for molds, which it renders refractory. Plumbago is one of the most difficult substances known to bring to a state of fusion. It is on this account also, that this same plumbago is utilized for manufacturing crucibles. From its composition, graphite approaches more nearly than any other body to pure carbon. Good graphite contains as much as 98 per cent of carbon and 2 per cent of ash. Graphite appears to be oily to the touch, and it preserves this property in high temperatures, so that the presence of plumbago in the molds facilitates the removal of finished pieces. Moreover, most frequently they take care, in order to favor removal from the mold and to avoid the adherence of the metal, to coat over the interior of the mold with a layer of plumbago.

BRICK DEBRIS.—Most of the metallurgical apparata are constructed of refractory bricks, or at least lined with such bricks. When an apparatus has finished its work and has to be demolished in order to be reconstructed, the whole bricks are put on one side to be used again; the debris, carefully cleaned or chipped, is pulverized, and enters into the manufacture of mortar employed for forming the joints in masonry of refractory bricks. The same mortar may be utilized for coating over the ladles and various accessories of the tapping apparatus.

SILICA BRICK.—These are used for constructing those parts of the metallurgical apparatus which have to support the greatest amount of heat. The singular property possessed in addition by silica bricks of expanding under heat instead of contracting like refractory earth, magnesia, &c., causes them to be sought for and utilized for the building of Martin-Siemens furnace vaults. The air and gas ways and the flues of these furnaces are also built of silica bricks. On the demolition of the furnaces the silica bricks are preserved with even more care than the refractory bricks. The debris incapable of being used in the construction is crushed small and sifted. In this way a sand is obtained which is in no way inferior to good quartz. The composition of silica bricks is ordinarily as follows: Silica, 98 per cent; lime, oxides of iron, alumina, &c., 2 per cent. It is necessary also, to take into account the physical state of this product, maintained during a long time at a very high temperature, so that it has lost all its hygrometric properties and realized all the changes of volume of which it is susceptible.

The crucible debris constitutes for the steel founder a most precious resource. It must not be lost sight of that the crucibles of refractory earth employed for the fusion of the steel are made with a scrupulous care which might seem absurd to persons not familiar with the difficulties of fusion. The manufacturers of crucibles, or the works which make their own crucibles, conceal as far as possible the details of their manufacture of these vessels of earth. The following, however, are a few general indications on this subject, on which they are able to graft a good number of variations.

A good refractory earth is taken and treated as follows: (1) Preparation of the earth, which is sifted by hand to eliminate everything of a stony, siliceous or foreign nature. (2) Pulverization of this earth so as to produce a semi-fine powder. (3) Formation of a flexible paste with the addition of water. (4) Transformation of the paste into pieces of square section, about 2 or 3 cm. thick and 15 cm. long. These pieces are roughly made. (5) Heating these pieces to a good red heat. (6) Pulverization of the pieces to obtain a fine powder. (7) Addition of water to this fine powder and methodical working-up of the paste produced. This working-up is the longest and most disagreeable operation of all; it is performed by men who tread the paste with their bare feet. (8) Manufacture of the crucible itself. At the moment of molding, or rather of withdrawing of the crucible, the paste is extremely flexible, and yet has sufficient body to support the upper parts of the crucible. (9) Drying of the crucible. Performed under heat this drying is very rapid, too rapid even, for the crucibles dried in this way do not always behave well in the fire. Dried at a low temperature—52 to 62 degrees. Fahr.—in places constructed for the purpose, the operation lasts from 5 to 6 months.

In the Exposition of 1889 there were to be seen some crucibles which had furnished from 40 to 50 tappings, and even more. In spite of these great exceptions, the ordinary crucibles do not stand more than from eight to twelve tappings on an average. When they are worn out they are scaled to remove the scoria adhering to them, and then broken up and sifted, when a refractory earth is obtained the composition of which is about as follows: Silica, 58 per cent; alumina, 40 per cent; lime, carbon, &c., 2 per cent. In like manner as the sand proceeding from the debris of the silica bricks so the earth resulting from the utilization of the old refractory crucibles are of great use for the molds. Unfortunately, the cost of these substances is very high; it commonly reaches 60 fr. per ton. The earth from old crucibles is often defective, and it is seldom used for making molds for large castings. It is employed for molds intended for castings of pieces of less weight.

## NOTICE.

All advertisements under this head given two insertions free of charge when placed therein by subscribers. All others will be charged 2 cents per word for each insertion.

WANTED—Foundry foreman in Chicago. Give experience, references and wages wanted. Address "L. X.," this office. 10

WANTED—Foundry foreman; one that understands green and dry sand work and thoroughly conversant with modern methods, and can handle men with good advantage; must be temperate and steady; to take charge of modern foundry fitted up with first-class appliances, it being part of an elaborate new manufacturing plant situated in a beautiful city of 10,000 inhabitants; unsurpassed school and church privileges. Address, stating age and salary wanted, "A," care of FOUNDRY, Detroit, Mich. 10

WANTED—Foundry foreman, in Chicago; give experience, reference and wages wanted. Address, "I. X.," this office 10

FOR SALE—Foundry business. We offer our business for sale. We are located in central New York in a place of about 8,000 inhabitants, a live, growing town, has more than doubled its population in ten years and bids fair to continue. We have the only foundry in this vicinity but owing to our health being poor we want to get out of all kinds of business and try some other climate. We have not been able to give it as much attention as it should have, and declined to take contracts which would amount to several thousand dollars a year on that account. We carry a stock of from $3,000 to $5,000, could be reduced to suit customer. Address, "J. M." 81 Ford Ave., Oneonta, N. Y. 10

FOR SALE—Half interest in foundry and machine shop; No. 1 opening for a molder or machinist; good location; will sell cheap John E. Warr, Atlantic, Ia 10

FOR SALE—Foundry and machine shop in a flourishing manufacturing city; small capital required; satisfactory reasons for selling. Address, Wm. Engbeing, Cedarburg, Wis. 10

WANTED—A good practical moulder to invest $500 to $1,000 in a small jobbing foundry doing a good business in a growing town and to take charge of and run it. A good thing for the right man. Address, Machinist, care THE FOUNDRY.

*Remember that to clubs of eight or more THE FOUNDRY will be sent for one year for 75 cents each.*

The brass foundry of the Cox Brass Mfg. Company, of Albany, N. Y., has been completely destroyed by fire. The loss is $15,000 and the insurance $10,000.

## NEW FOUNDRY ENTERPRISES.

Colorado City, Colo., is to have a new foundry.

The Butler M'f'g. Co., of Butler, Ind., are building a foundry in which they will make the castings for their wind-mills, pumps, etc,

H. L. Chapman, of White Pigeon, Mich., has removed to Marcellus.

The new foundry of the Church M'f'g. Co., at Adrian, Mich., is about completed.

The Hinsdale Foundry at Springfield, Mass., will be ready for occupancy in two months. It will be 44x75 feet.

The Saugatuck Iron Foundry has been incorported in New York City; capital $30,000, to manufacture furnaces, ranges, etc.

The Iron Foundry Co., at Birmingham, will probably begin the erection of its contemplated new addition at no very distant date.

An addition of 60x60 feet is being built to the iron foundry of the Portsmouth Machine Co., Portsmouth, N. H.

The Forbes Malleable Iron Works, at Rockford. Ill., are building an addition to their foundry that will give working room for 75 molders.

The Chester Steel Casting Co., of Chester, Pa., are building an addition to their foundry, which will be 50x50 feet, a new furnace house 40x40 feet, and a gas house 50x80 feet.

The Menominee Iron Works have incorporated at Menominee, Mich., with a capital stock of $25,000. A large machine shop and foundry will be erected at once.

The Ludington Daily Mail is authority for the statement that the city has secured a foundry, to be moved from Chicago and give employment to from 50 to 100 hands the first season. A brick building 50x150 feet will be erected immediately.

The Ætna Foundry and Machine Company, at Warren, has been incorporated with a capital stock of $50,000 The incorporators are H. K. Taylor, H. M. Garlick, Lloyd Booth, C. H. Booth and C. W. Bray. A complete organization has not been affected yet. The establishment was formerly the Ætna Machine Company, which has been conducted by the Lloyd-Booth Company for more than five months. It is the intention of the incorporators to make many improvements. The output of the plant will be tin plate and general rolling mill machinery. J. W. Russel, of Hubbard, will manage the concern.

Ross Meham Co., Chattanooga, are in their new foundry.

A new foundry and machine shop to cost $10,000 will be built at St. Joseph, Mich.

The Geauga Foundry M'f'g. Co., of Cleveland, O., was organized nearly three-quarters of a century ago by Blair & Sanford, and has been in continuous business ever since. Their capacity is 25 stoves a day, employ 45 men and carry from 1,000 to 1,500 stoves in stock.

The Ontario Malleable Iron Company has been incorporated at Oshawa, Ont., with a capital stock of $100,000, to manufacture castings and other forms of iron, steel and other metals. Wm. F. Cowan and John Cowan are numbered among the incorporators.

The proposed steel foundry for Japan will, according to the Japan Weekly Gazette, undoubtedly become an accomplished thing, despite the fact that the Japanese Diet has twice rejected the proposal. The necessity for the foundry is recognized, but the scheme laid before the Diet was not sufficiently investigated, and the Upper House adopted a representation to be sent to the Government asking for further detailed investigations. The naval authorities contemplate bringing forward a scheme next session.

R. Hoe, the well-known printing press manufacturer of Brooklyn, has leased the foundry formerly operated by Robt. Dawson & Sons at South Smith street and Kent avenue, Brooklyn, N. Y. They began operations there Nov. 1st. Sam Henry, who has been in the employ of the firm for the last 12 years and has been assistant foreman of their New York foundry for several years, takes charge. Mr. Henry is well known as a thorough mechanic, with splendid executive ability and his selection will reflect credit on the firm. Between 30 and 40 molders will be employed.

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*If you are not already a subscriber to THE FOUNDRY, you should be. Why not form a club and take advantage of reduced rates. Eight or more subscribers can have it sent to each address for 75 cents each.*

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The new foundry of the Schnectady, N. Y., Locomotive Works is in operation, It is 387x 100 feet, 2 stories high and well lighted. The works now employ 1,875 hands and turn out 30 engines a month.

## KANSAS CITY, MO., ITEMS.

The Western Steel and Iron Castings Co., a concern just got in active operation, are now turning out a superior class of crucible steel castings, the metal being particularly good. They have 6 furnaces, 2 pots each and cast twice daily. Are doing a very general class of work in machine, car, locomotive castings, cable grips and miscellaneous class of work. Mr. Mather, the manager, is an old steel maker of 30 years experience and Mr. Sandmeyer is a young man of great experience in furnace building, having built furnaces in nearly every large plant in the country. Their success is certain and the proof of the superiority of their work is the overwhelming quantity of orders now on hand.

The Iron Foundries here keep pretty busy and seem to have plenty in sight for some time to come, while building work is slacking up some. The machinery trade keeps good and the demand seems to keep up pretty well. The stove foundry is crowded and is 6 weeks behind, and is casting every pound they can to keep up. The foundries devoted to special lines of work are so busy that they can not give any attention to other work.

Good molders are still in demand, as in fact, they always are. Wages seem to be good.

## THE DECEMBER NUMBER.

GOOD agents are wanted in every city to represent THE FOUNDRY. From this time forward it will be a paper that will sell on sight and every man who takes even the very slightest degree of interest in the foundry business or anything pertaining thereto will find it indispensable.

## OUR PORTRAIT GALLERY.

COMMENCING with the December number THE FOUNERY will begin the publication of a series of portraits, accompanied with biographical sketches of men who have helped to make the foundry business in America famous and who have added lustre to it and brought honor to themselves by their connection with this important branch of America's industries. Watch for it.

## STRAIGHT TO THE POINT.

CRAIG, RIDGEWAY & SON, of Coatesville, Pa., in sending in their advertisement, relieve themselves as follows:

"We have been so very much occupied in keeping up the demand with our present facilities that we have taken no pains to hunt up customers. We have lately, however, felt the ambition to greatly increase our capacity and were wondering how to reach the foundry trade in the best way, when your paper came to hand like a Godsend, and we are prompt to take your largest space. It has always been a mystery to us while while all other trades had their multitude of trade papers, why there has been none in the foundry trade. There is a large clientage among the men and a good field among advertisers, and if you manage with any sort of skill you will soon have a mighty good paper. We especially want to reach the men who work in the foundries, for it is from them the foremen come, and it is the foreman who would say, for instance, "if you will get me one of those rapid Ridgway cranes, I will turn out more work at less cost," and it is talk like that that wakes them up in the office."

*Subscribe for THE FOUNDRY. Only $1.00 a year.*

THE FOUNDRY is certainly a new departure in the way of an iron work paper, and deserves the patronage of every molder in the land.

D. H. ULRICH,
National Iron Works, Spokane, Wash.

I sincerely hope its support will be such as will insure its life to a good old age.

F. B. SHAFFER,
Elizabeth, N. J.

We received your "sample copy" of THE FOUNDRY, and heartily endorse the publication of such a journal in the interests of the foundry business. We sincerely hope you will make it as practical as possible in all respects, and that through your efforts in this direction that our business may receive its proper position among other mechanical industries. We wish you success by subscribing for a copy for one year, and using our influence to get others to do likewise. Yours respectfully,

JAMES ANDERSON & SONS,
Salt Lake City, Utah.

## VIRGINIA AS A PRODUCER OF FOUNDRY IRON.

MR. CHARLES CATLETT in a recent communication to Yost's Weekly, states that Virginia furnaces can make a first-class foundry iron at the present prices, and at a profit. If they do this the effect on the future development of the iron industry cannot be overestimated. Virginia would be looked to as the great producer of foundry iron in this country, the present furnaces would be pushed with renewed vigor, while the most conservative capitalist would hardly fail to invest where the furnaces were able to make good their claims and meet successfully the hardest times known. To do this, however, a majority of the furnaces will have to make improvements looking to more economic methods.

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I believe there is plenty of room for a journal of this kind, and think it will be of advantage to the manufacturer and moulder alike.

F. L. LANBACH,
Steubenville, Ohio.

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## HOW TO MEND CAST IRON.

IT is generally thought that when any cast iron object is broken that is the end of it and it is useless to try to mend it. A clever amateur workman tells the New York Tribune that a cement may be made which will hold the parts together perfectly. It is as follows: Take two ounces of sal-ammoniac, one ounce of sub-limed sulphur and one pound of cast iron filings; mix in a mortar and keep the powder perfectly dry. When it is to be used, mix it with twenty times its weight of clean iron filings; grind the whole in a mortar, wet with water until it becomes a paste and apply to the parts to be mended. After a while it will become as strong and hard as any part of the metal.

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The Patternmakers of America are likely to have a neat trade journal of their own before very long if its present editors have their way about it. The October number is greatly improved, and Messrs. Kuberg & Diehl deserve to be congratulated. Address 152 Pulaski St., Brooklyn, N. Y., or 759 Carrol Ave., Chicago, Illinois.

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*Invite some of the men in your shop, who are interested, to join you in forming a club and get this paper for 75 cents a year each. Try it.*

We believe that a good many foundrymen, and notably those who melt iron for the manufacture of machinery and for light castings, do not sufficiently appreciate the advantages which might accrue to them by using charcoal iron more largely. Charcoal iron has been selling at very low prices for a long time, and in certain sections of the country, notably those cheaply reached by the Michigan product, the cost over good coke iron is not very great. In a good many cases the slightly higher cost would be more than compensated for by considerably increased strength, and it might be possible to cheapen the mixture without much sacrifice of that advantage by using lower grades of coke irons. The difference between charcoal irons and good coke pig is only about $1.50 to $2 in the leading markets on the Lakes—an amount which does not cut much of a figure in the cost of many kinds of castings when greater strength is considered. Sellers of charcoal pig might do good missionary work in this direction, particularly if they are in a position to give consumers some assurance that the matter has some elements of permanency.

"THE FOUNDRY" is the title of a new monthly paper which has made its appearance. It is of magazine form, contains 32 pages and has a neat colored cover. It seems to fit into a hitherto unoccupied nitch in American journalism and ought to score a success. It is published at Detroit. Mr. John A. Penton is the manager. We wish him success.—*Journal of Commerce, Chicago, Ill.*

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*WANTED—A way in which anyone interested in the foundry business can secure greater value for their money than by subscribing for this paper, $1.00 a year. Clubs of eight or more, 75c each.*

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The B. F. Sturtevant Co., Boston and Chicago, have received orders recently for supplying their system of heating to the large foundries being constructed by the National Malleable Castings Co., Chicago, and the Carnegie Steel Co., Bessemer, Penn. Each of these plants will require a blower over 20 feet in height and the heaters will contain over three miles of 1 in. steam pipe. Both these foundries will also be supplied with the Sturtevant cupola blowers, to be driven by direct connected Sturtevant electric motors, and will be the largest of this type of machine that has been installed in this country.

## BOOKS, EXCHANGES, CATALOGUES, ETC.

The S. Obermayer Co., of Cincinnati are mailing to their customers a neat circular discriptive of their Reliance Core Compound. It is claimed to possess especial advantages for small cores, used in brass foundries, etc., besides being cheap and not possessing the disadvantages common to the foundry flour barrel.

G. P. Millns, of "Perfect Wash" fame and manager of the Cleveland Facing Mills, is always remembering his friends in some way. His latest is a neat pocket papier-maiche slate of 6 pages with pencil, with which he is "slating" all his old friends and as many new ones as he can get.

Just the thing for a Foundry Foreman's vest pocket. Sent free with sample of "Perfect Wash."

We are in receipt of a neatly bound, well-written little book of about 100 pages entitled "Simple Lessons in Drawing" by Orville H. Reynolds, and published by The Debs Publishing Company, Terre Haute, Ind. It seems to be just what its name implies and we feel sure would be a valuable aid to all beginners in that most interesting study which is so valuable to all mechanics and so little understood. The price is not given, but we are under the impression that it is intended to be within the means of all and consequently is moderately priced.

The B. F. Sturtevant Co., Boston, Mass., have printed a second edition of 10,000 copies of their 200-page general catalogue No. 61, which describes the uses of their blowers, exhausters, engines, forges and heating and ventilating apparatus and they desire to place a copy in the office of every superintendent, purchasing agent, engineer or manufacturer using such machinery.

All who have not received a copy will confer a favor by applying at once to above address.

It will be mailed free of charge

The Berlin Iron Bridge Co., of East Berlin, Conn., send us a large and very handsomely illustrated catalogue of over 100 pages, which deals at length with the iron structures for which this firm has become so justly famous. The many modern foundries which have been erected in this country during the past few years, in which iron has been extensively used, have been put up by this company. The very nature of the foundry business is one that is peculiarly benefited by the adoption of the methods used in iron structures, safety against fire, a wide span free as possible for supporting columns, strength to support in many instances heavy cranes, etc., are all in this catalogue elaborately illustrated.

## A NEW DEPARTURE.

WE have received the initial number of a new departure in the journalistic world. "THE FOUNDRY," published by The Foundry Publishing Company, of Detroit, and edited by the past President-Secretary of the Brotherhood, Bro. John A. Penton. "THE FOUNDRY" is a neat thirty-two page Journal, replete with matters of interest to foundrymen. It would appear that this journalistic prodigy had passed the stage of babyhood before it reached the hands of the printer, as it comes before the world a full fledged Journal, chock full of advertisements, and promises before the second issue to outgrow its clothes. Success to Bro. Penton."—*Machinery Molders' Journal.*

Enclosed please find $7.50 for ten subscribers to be sent to acdress enclosed.

OSCAR B. CECIL,
Foreman S. P. R. R. Foundry,
Houston, Texas.

## PERSONAL MENTION.

W. Fitzpatrick, of the S. Obermayer Co., Cincinnati, reports business as being away above the average through Ohio, and says that that firm's well-known brands of facings are meeting with a ready sale.

Mr. J. Davies of Racine, Wis., has been instrumental in sending THE FOUNDRY 95 subscribers of that town alone, and there are hundreds of men in this country so situated that they could do fully as well, if not better, if they were to try.

Mr. Lincoln, of Lincoln's Foundry, Boston, Mass., has associated with himself Mr. L. C. Jewett, who is well known to foundrymen throughout the country, having had charge of shops in Dayton, Toledo, Yonkers, Hartford and Brooklyn. Knowing Mr. Jewett to be a thorough foundryman we can congratulate Mr. Lincoln.

Their principle work is printing press, sugar house and boiler work.

THE FOUNDRY notes with pleasure the fact that one who has always taken a very great

interest in everything relating to the foundry business and has designed what is, perhaps, the most complete foundry plant in America, besides securing many valuable patents on foundry appliances, viz: Mr. John Walker of the Walker Manufacturing Co., Cleveland, Ohio, has been recently made the recipient of some most distinguished honors at the hands of a number of his fellow citizens. At the military council of the Army of Uniformed Sir Knights Order Sons of St. George, held at Detroit on the 17, 18 and 19th of October, he was unanimously elected to the post Commander of the Army throughout the world, with the title of Lieutenant General Commanding. The Uniformed Sir Knights are the most important organization of British Americans on this continent. The main object of the movement is "To revive and adapt the ancient spirit of English Chivalry to the conditions of modern civilization." Since that event, however, we have been pained to learn that a most painful and perhaps serious accident has befallen Mr. Walker. The American Street Railway Asssociation have been holding their convention in Cleveland, and among other courtesies extended to them was an invitation to visit the works of the Walker M'f'g. Co., which was accepted and about 200 of the members with ladies, on Oct. 21st, availed themselves of the opportunity to visit this celebrated establishment which makes a specialty of cable railway machinery. They were royally entertained and afterwards sat down to lunch in the "drawing room" of the works, which was gaily decorated for the occasion. When leading the procession of carriages across the Cleveland viaduct, however, Mr. Walker's carriage was struck by a strange cart and he was thrown out, falling on his right knee. As we go to press we learn that inflammation has set in and bears quite a quite a serious appearance.

## AMONG THE FOUNDRIES.

The old Vulcan foundry was partially destroyed by fire recently. Cause, a passing locomotive.

The Whitman Agricultural Co. are very busy on hay press work, having turned out castings for 160 presses complete, in the past month.

Chas. A. Pero, who is well known in the New England States section, has accepted the position of foreman of the iron foundry at Thomsonville, Conn. He reports business rushing there.

The Wuerpel Switch and Signal Co. of E. St. Louis, contemplate the erection of a foundry to their works.

The Rankin & Fritch Foundry, St. Louis' are building 3 tandem and 4 cross compound, all of the Corliss type.

The Gurst Bros. Architectual Foundry are exceedingly busy on scroll work and stove repairs.

Owing to the present busy season the Missouri Mallable Iron Co. are experiencing some difficulty in securing bench molders.

The Standard Foundry, St. Louis, are engaged principally on city fire plugs, with pulleys and hangers for out of town concerns.

The Douglas Pump Co., of Middletown, Conn., are doing a good business, the brass department doing time and a quarter with a full force.

We are pleased to report that business is booming with the Pratt & Whitney Co., Hartford Conn., They have recently received some very large orders.

Theo. Lincoln is building a large addition to his foundry at Hartford, Conn., as he finds his room inadequate to meet the demands of his rapidly increasing business.

The St. Louis Steel Co., burned out recently at E. St. Louis, have resumed again in a portion of the unoccupied quarters of the Sheckell, Harrison & Howard Pipe Shop. Car couplings and engine cranks is their specialty.

The St. Louis Sash Weight Co. are enlarging their foundry to accommodate ten additional molders. The original charter of the Co. expired Oct. 12, but was re-incorporated for 30 years, with Herman Hess, Pres., Adam Linck, Sec.-Treas., and L. J. Rodman, V.-P.

The St. Louis Iron and Machine Co. are building the following sized Corliss engines: One 20x42 and one 20x36, with ammonia compressor, for 20-ton ice machine; 2 Lion brick presses and some special castings for the Wuerpel Switch and Signal Works, together with repair work for Mississippi River steamboats.

The Carondelet foundry increased their capacity of molding room last spring, and from present indications will have to do so again. They melt 20 tons of iron daily, their principle work being Grey Iron for the Wrought Iron Range Co., Quick Meal Stove Co. and the Twin Burner Stove Co., with some miscellaneous orders.

The Eclipse Stove Co., of Mansfield, have got their stakes driven for a large addition to their foundry, 60 feet long.

The McNeal Boiler Co., of Akron, O., are putting up a new foundry at Barberton, O., a suburb of Akron, O.

The foundry started by Mr. Coates of Alliance, O., at Cambridge, O., is very busy. They have the work of the Cleveland & Marietta Railroad.

The molding department of the Sterns M'f'g. Company at Erie, Pa., has been damaged by fire to the amount of $7,000. The main structure escaped damage.

The Schuyler Electric Co., of Middletown, Conn., have just finished an addition to their brass foundry which will enable them to double their present capacity of ten benches. They have received a large government order for search light dynamos.

The South St. Louis Foundry, under the managament of R. J. Kilpatrick, have closed their pipe pits and will resume in the general jobbing business again. G. Lineman, the foreman, resigned to accept a similar position at Metropolis, Illinois.

Pierce, Butler & Pierce, of Syracuse, N. Y., are rushing their foundry on towards completion, as they hope to be able to move from Geneva, N. Y. soon. They sold their 63-inch Collian cupola in Geneva to the Herenden Mfg. Co., and are replacing it by another one 76 inches in diameter.

The new steel gun recently built at the Washington Navy yard for one of the war ships is a monster. Its length is 46 feet and it tapers from a diameter of 49 inches at the head to 21 inches at the muzzle. It weighs 79 tons and burns up more than 500 pounds of powder whenever fired and will hustle a 1000-pound shell 13 miles in 30 seconds.

The Wollaston Foundry Co., of Boston, Mass., whose works were totally destroyed by fire last May, say they did not know they had such a reputation for fine castings until after the fire, when all of their old customers urged them to rebuild, which they did as soon as possible on an enlarged scale, and now have all the work they can handle. Among their customers are the Emerson & Everett Piano Co. and others. One firm went so far as to erect a fire proof brick building for the storage of their patterns. This building is built on the Wallaston Co's. property.

The Dayton Malleable Iron Co. are enlarging and getting ready to increase their force.

King Bros.' foundry and machine shop at Grand Rapids, Wis., burned. Loss, $6,000; no insurance.

The Buckey Malleable Iron Co. are enlarging their capacity and getting ready to employ 75 more molders.

Owing to increasing business the Thos. D. West Foundry Co., at Sharpesville, Pa., although only started three months, is now adding an extension of 130x100 feet to their plant.

The old Colony R. R. have buiit a very handsome depot within 200 feet of their works, the station being named Norfold Downs. The lady so christening it receiving a fine building lot in return.

The foundry of the Brown & Sharp Co., Providence, R. I., exclusive of bath and wash rooms, cleaning rooms, cupola house, etc., is 265x67 feet, and it is said the company take pride in showing visitors through their works at all times.

We have received notice that the firm trading as Maris Machine Company has sold out to, and been succeeded by, the firm bearing the name of Maris & Beekley, who will continue the business of manufacturing and building cranes of all descriptions, overhead tramway, teal portable hoists, trolleys, etc., at 2343-2345 Callowhill street, Philadelphia, Pa.

Clark & Flynn's copper and iron foundry, Jersey City. N. J., has been destroyed by fire.

At West Duluth, Minn., the Marinette Iron Works have just turned out the second of the two enormous engine beds for the roller mill of the York plan. These beds weigh about 45 tons and are about 27 feet long. The foundry is also casting 100 tons of floor plate for this plant.

The model foundry, machine and boiler plant of Fraser & Chalmers, Chicago, limited, will be traversed by Ridgway's balance steam hydraulic cranes, manufactured by Craig, Ridgway & Co., of Coatsville, Pa. There will be six of them in the foundry, two in the yard for handling flasks, etc., and others in the shops. The company has a perfect electrical installation for driving the traveling cranes, and their plant, when completed, will embody the latest improved machinery and practice.

The Haugh-Kurtz Steel Company, of Anderson, Ind., manufacturers of open-hearth

The foundry of James Baines, Oshkosh, Wis., was burned Oct. 28th. Loss, $2,000.

The Adams Iron Foundry, at Dubuque, Ia., started in August, has been completed. It is 240x85 and built of brick and glass. About 75 men will be employed.

The Mt. Pleasant Facing Mill Co., Mt. Pleasant, Pa., manufacturers of foundry facings, etc., have sustained loss, the amount of which is not stated, by recent fire.

The foundry of Noyes & Goddard, at Waterville, Maine, has been destroyed by fire at a loss of $10,000 in patterns, castings and raw material.

"Minneapolis and St. Paul foundries are over run with orders. Our volume of business is a great deal larger than last year and we have not only added considerable to our establishment but also to our force of workmen." So writes the St. Paul Foundry Co. concerning business and the outlook in its line.

steel ingots, billets, castings, etc., is very busy in the manufacture of large castings for United States government work. It recently cast the largest crank shaft ever made, it is said, in the United States, and also large cylinder heads. It is now on with work weighing 3 tons and upwards, respectively. A large crane and a 42-inch planer have recently been installed.

The Southern Malleable Iron Company, Chattanooga, Tenn., have resumed operations after being closed down for several weeks and are now making four runs per day. The company recently bonded their plant for $50,000, the bonds being taken in a short time by a St. Louis firm at par. An addition 325x75 will be erected.

## THE IRON INDUSTRY.

### Conservative Ideas by a Bay City Writer.

NOTWITHSTANDING the gratifying reports published by R. G. Dun & Co. concerning the general prosperity and activity of the iron industry in its various departments, candor compels the admission that these commercial reports are at variance with the facts, and a careful perusal of the trade journals published in the interests of the machinery foundry and cognate industries, demonstrate that although they do not incline toward a pessimistic view of the present situation, they are also lacking in the roseate views emanating from the source alluded to.

Of course, when commenting on this subject, the fact must not be lost sight of that the present is the season of the year usually inclined toward slackness, and also that a presidental year just previous to election, when the attention of business men is absorbed in a national political contest, the natural and inevitable tendency is to neglect even pressing business considerations to promote their own particular ideas of citizenship, as expressed by the political party with which they may be affiliated, and hence a lack of business activity is a natural consequence. It must be observed, however, that although a candid admission concerning the present situation of the iron industry is not indicative of special activity, the outlook for the future, when the political effervescence shall have subsided, and business has resumed its normal condition, gives promise of healthy thriftiness, even though it may not warrant the prediction of unusual activity.

Bay City has quite a number of extensive iron working industries, all of which are enjoying a fair degree of prosperity. The Industrial works is one of the largest institu- institutions of its kind in the state, and has this year erected an enormous building across the street from its former extensive plant; the McKinnon establishment, adjacent to the Industrial works, is also extending its operations; Smalley Bros. machine shop and foundry, adjoining the last named establishment, is one of the oldest in the city, and has grown to very large proportions; the Bay City Iron Works, in the north end of the city, has increased its capacity recently and is an industry of growing tendencies; another one, the Standard Machine Works of M. Garland, in the south end of the city, has grown from a modest beginning until it is one of very extensive proportions, and withal one of the most complete in all its appointments with modern labor-saving machinery. Machinists throughout the city state that it is also one of the most desirable establishments in the city for the employee. Mr. Garland last year purchased adjoining property across the street and erected the Acme foundry, one of the most perfect establishments of the kind in Bay City, the arrangements for ventilation therein being so perfect that it is absolutely comfortable during the taking off of a heat.

Yours respectfully,

M. C. CLINE.

Iron Mountain, Mich., is to have a new foundry.

## MARKET REVIEW.

REPORTED EXPRESSLY FOR "THE FOUNDRY."

### CINCINNATI.

Oct. 29, 1892.

The business of the past week has been but fairly active. The advanced price of Southern coke irons are well maintained and further appreciation would be justifiable were it not for the indisposition of Northern makers to advance their figures, At the moment it seems to be an adjusting and settling period, preparatory to a general upward march of values. There is not an absolute conflict between Northern and Southern makers, but the Northern furnacemen have not reduced their accumulations, as their Southern brethren have, and hence feel a timidity as yet in marking up their prices. It is likely that business this week will render such action warrantable the coming week. Bessemer iron has enjoyed a most gratifying elevation, and steel billets and slabs a corresponding improvement. Lake Superior charcoals and Southern car wheel irons are very firm, and advanced prices are being obtained on the leading reliable brands. All the metal industries of the country, excepting the rail mills, are busy. Steel works, rolling mills, car works, tool makers, foundries and implement manufacturers are all in full operation, and many of our customers tell us they have never known a period when there was more profitable work in sight.

Money is abundant and general business being conducted upon conservative plans, confidence prevails, and the week closes with a healthful, hopeful outlook for the future,

We quote for cash f. o. b. cars Cincinnati :

| | |
|---|---|
| Southern Coke, No. 1, F dry | $13 75 to $14 00 |
| " " No. 2, " and No. 1 Soft, | 12 50 to 12 75 |
| Hanging Rock Coke, No. 1 | 15 50 to 16 00 |
| " " Charcoal, No. 1 | 18 50 to 19 50 |
| Tennessee Charcoal, No. 1 | 16 00 to 16 50 |
| Jackson Co. Stone Coal, No. 1 | 16 00 to 16 50 |
| Southern Coke, Gray Forge | 11 50 to 11 75 |
| " " Mottled | 11 00 to 11 25 |
| Standard Alabama Car Wheel | 18 00 to 19 00 |
| Tennessee " " | 17 00 to 17 50 |
| Lake Superior " " | 17 50 to 18 00 |

Rogers, Brown & Co.

### ST. LOUIS.

Oct. 29, 1892.

The past week has witnessed the heaviest buying movement for the same period of time since January 1st.

The market continues to improve and prices advance contrary to the prediction of some of the heavy consumers, who would now like an opportunity to make contracts for iron, deliverable the first half of next year, at prices ruling 30 days ago.

The situation, however, is decidedly in favor of the seller, and buyers are beginning to realize this fact. Gray Forge is firmly held at $9.00, Birmingham basis and the Furnaces are not overly anxious for orders at this price. We are again compelled to mark up quotations 25 cents per ton on all grades.

We quote for cash f. o. b. cars St. Louis :

| | |
|---|---|
| Southern Coke, No. 1 | $14 50 to $14 75 |
| " " No. 2 | 13 25 to 13 50 |
| " " No. 3 | 12 75 to 13 00 |
| " Gray Forge | 12 25 to 12 50 |
| " Charcoal No 1 | 16 00 to 16 50 |
| Missouri " No. 1 | 14 50 to 15 00 |
| Ohio Softeners | 16 50 to 17 00 |
| Lake Superior Car Wheel | 18 00 to 18 25 |
| Southern " " | 18 50 to 18 75 |
| Frick's Connellsville Foundry Coke | 5 65 |

Rogers, Brown & Meacham.
J. K. Pollock, Manager.

### BOSTON.

Oct. 29, 1892.

We quote for cash delivered Boston :

| | |
|---|---|
| Standard Alabama 1X | $15 50 to $16 00 |
| " " 2X | 14 50 to 15 00 |
| " " 1 Soft | 14 50 to 15 00 |
| Niagara (Strong L. S. Coke Iron) | 17 00 |
| Embree (Foundry Bessemer) IX | 15 75 |

Rogers, Brown & Co.
L. L. Hull, Resident Agent.

### CHICAGO.

Oct. 29, 1892.

An active mardet is still the ruling condition; the demand continues good for all kinds of foundry iron, the call on the Southern Furnaces being especially for soft grades, Since last report several companies have advanced Grey Forge to $9.00, and No. 1 Soft and No. 2 Foundry to $10.00, which is a further stiffening of 25 cents per ton above previous change. Stocks at the Furnaces are being materially reduced, and reports for November 1st are certain to show a large reduction during the present month. Requests to hurry shipments are numerous, indicating that many consumers are running from hand to mouth as to supply; this is owing in part to the extreme car famine which prevails. Northern coke irons continue to be held firmly and makers of this class of metal are refusing to make concessions. The whole situation is of firmness and a better tone exists in consequence both among the manufacturers and consumers.

Lake Superior charcoal irons remain unchanged, $17.00 Chicago is the minimum at which leading brands can be purchased and a number of furnaces have been obliged to refuse further business for delivery this year as contracts made early in the season will take their

entire output. Stocks are being rapidly cut down by heavy deliveries which are going forward and which must be completed before close of lake navigation.

We quote for cash f. o. b. Chicago:

| | |
|---|---|
| Southern Coke, No. 2 Foundry | $13 50 to $14 00 |
| Southern Coke, No. 2 Soft | 13 25 to 13 75 |

Rogers, Brown & Merwin.

## BUFFALO.

Oct. 29, 1892.

The interest of consumers of pig iron in this vicinity has at last been awakened. The inquiry has largely increased, though it is by no means as large as it would be if the real situation was understood. Further than this, buying seems to have begun in earnest and some good sized sales have been consummated during the past few days.

Southern iron has still further stiffened, being very firm at the advanced prices. There have been some slight advances in Lake Superior coke irons with indications of further advance. Lake Superior charcoal is in some instances held at fifty cents above prices quoted in our last bulletin.

We quote for cash f. o. b. cars Buffalo;

| | |
|---|---|
| No. 1 X Foundry, Strong, Coke Iron, Lake Superior ore | $15 25 |
| No. 2 X Foundry, Strong, Coke Iron, Lake Superior ore | 14 25 |
| Ohio Strong Softener No. 1 | 15 25 |
| Jackson County Silvery No. 1 | 17 30 |
| Lake Superior Charcoal | 17 00 |
| Tennessee Charcoal | 17 00 |
| Southern Soft No. 1 | 14 40 |
| Alabama Car Wheel | 19 00 |
| Hanging Rock Charcoal | 20 50 |

Rogers, Brown & Co.
W. T. Shepard, Mgr.

## PHILADELPHIA.

Oct. 29, 1892.

Prices remain firm and unchanged since the last report. Consumers of iron are using it faster than they expected to when the contracts were made and consequently every one is in a hurry, and furnaces find it simply impossible to ship iron fast enough to meet the wants of their customers. Ten, or even five years ago the same conditions that exist to-day would have moved the price of iron up from $5.00 to $7.00 per ton. The chances for an advance are good, providing the election goes our way. Furnaces should have at least $1.00 above present prices in order to make fair interest on their investment.

We quote for cash f. o. b. cars Philadelphia.

| | |
|---|---|
| Standard Penna. No. 1 X | $15 50 to $16 00 |
| " " No. 2 X | 14 50 to 15 00 |
| Standard Ala. No. 1 X | 15 25 to 15 50 |
| " " No. 2 X | 14 25 to 14 50 |
| Best Ala. Gray Forge | 13 25 to 13 50 |
| Standard Alabama C C C W., such as Bibb or Woodstock | 20 50 to 21 00 |
| Lake Superior Charcoal | 18 50 to 19 00 |

Rogers, Brown & Co.
J. M. Warner, Mgr.

## PITTSBURG.

Nov. 1, 1892.

So far as actual selling prices are concerned the metal market here is almost exactlv where it was at the beginning of October, but there are now indications of a change for the better which were not so apparent at that time. There has been a considerable reduction in stocks, and while there is yet too large an accumulation of iron on hand to justify any expectation of a sharp advance, yet the fact that the consumption is now ahead of the output imparts a decidedly stronger feeling to the market. Parties who a few weeks ago were anxious to sell, and were disposed even to shade prices somewhat if necessary, are now holding firmly at figures quoted below. The most disturbing factor in the present situation is the extreme scarcity of railroad cars, which interferes greatly with the transportation of Pig Iron and Coke.

Cash quotations f. o. b. cars Pittsburg are as follows:

| | |
|---|---|
| No. 1 Foundry | $14 50 to $15 00 cash |
| No. 2 Foundry | 13 50 to 14 00 " |
| Gray Forge | 12 50 to 12 75 " |
| Mottled and White | 12 00 to 12 25 " |
| Warm Blast Charcoal | 18 00 to 22 00 " |
| Cold Blast Charcoal | 22 00 to 27 00 " |
| Bessemer | 13 85 to 14 00 " |

A. H. Childs.

## DETROIT.

Nov. 1, 1892.

The demand for the last few days has not been quite so active as the first half of October, but this may by only a temporary lull and may precede an active market and still further advances. This is the general impression among sellers. While no general advance has taken place, certain well-known brands of Southern irons have raised prices from twenty-five to fifty cents per ton, but other furnaces not so well supplied with orders, are still accepting former figures.

The demand for car and ship-building material has been active, and prices remain firm.

We report a quiet market, and quote as follows:

| | |
|---|---|
| Lake Superior Charcoal, all numbers | $16 50 to $17 00 |
| " " Coke, Bessemer | 16 00 to 16 50 |
| " " " Foundry, all ore | 16 00 to 17 00 |
| Standard Ohio Black Brand | 16 50 to 17 00 |
| Southern, No. 1 | 14 50 to 15 00 |
| Southern Gray Forge | 12 50 to 13 00 |
| Jackson County (Ohio) Silvery | 17 75 to 18 25 |

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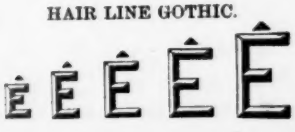

# DIXON'S

PLUMBAGO OR BLACK LEAD

# CRUCIBLES

Have been known among foundry men for nearly three score and ten years. They are considered by governments and smelters throughout the world as the

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For Quality and Long Life.

We employ only skilled and experienced workmen and use the best material. We invite inquiries for circulars, etc., from all who are interested in blacklead crucibles or other graphite productions.

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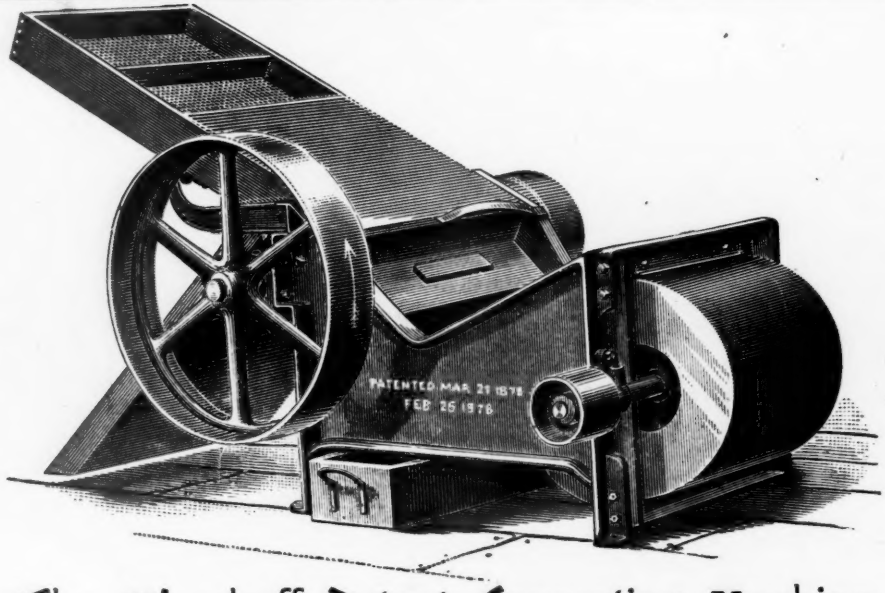
JERSEY CITY, N. J.




## The Woodruff Patent Separating Machine.

Saves all shot and scale iron from foundry refuse. Used, appreciated and commended by Leading Founders in all parts of the country.

**THE AUDUBON MACHINE WORKS,**

**Builders of Special Machinery.** **NEW HAVEN, CONN.**

# Persuasive Eloquence.

A Great Deal of Natural Gas is sometimes brought into service to effect the sale of any and all Kinds of Goods,

## FOUNDRY SUPPLIES

included. Our Method is somewhat different, we try to handle Goods which will sell themselves when once introduced. No one appreciates a good article more than a foundryman, for instance, here is a Riddle, first-class in every Particular and at a very Reasonable Price. Another thing, we have an Immense Stock of

# FOUNDRY FLOUR,

made from Michigan wheat, packed in barrels, (196 lbs.) which we can deliver in car loads or less to every Foundry in the entire Country at lower prices than ever before offered.

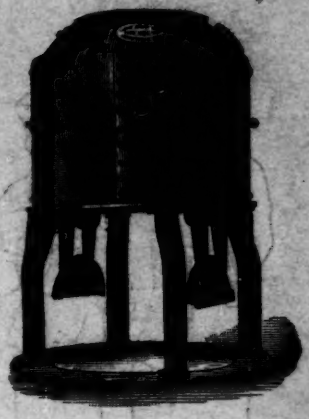
Write for Prices.

# F. B. STEVENS,

**74 Griswold Street, DETROIT, MICH.**

# THE BYRAM—COLLIAU

## CUPOLA FURNACE



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RAPID MELTER,

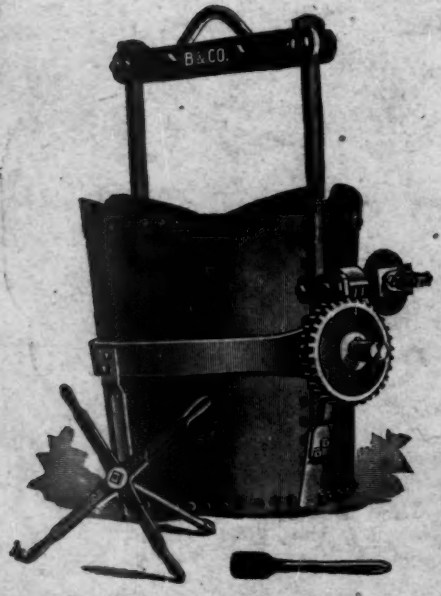
ECONOMICAL.

OUR Works are now running full double turn, making twenty-two (22) working hours each day, and we take this opportunity of asking the indulgence of our patrons, if their orders are not filled as promptly as they think they should be.

We hope to "catch up" with our orders before the close of the year and are filling each in turn.

**BYRAM & COMPANY,**

**FOUNDRY OUTFITTERS.**




OUR NEW

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ALL SIZES FOR ALL PURPOSES.

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